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## Cancer of the Esophagus: Original Technique for Total Esophagectomy

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A review of the literature on the subject of total esophagectomy for cancer shows that experience in this field is relatively small, and that only in the last few years have results begun to offer encouragement. Although early roentgenologic and esophagoscopic diagnoses are now made more frequently, the seriousness and high mortality of esophagectomy still deter surgeons from employing the operation more frequently.

After making a series of studies on cadavers and after having done total esophagectomy on five patients, I have found that the operative technique may be simplified greatly, thus reducing complications and mortality. The purpose of this paper is to describe the new technique in order that it may be subjected to the test of use in other hands.

Total esophagectomy requires consideration of several aspects of anesthesia and technique that should be taken up separately.

*Anesthesia*—Contrary to the choice of many surgeons, I prefer peridural rather than general anesthesia. I have done not only thoracoplasties and other operations on the thoracic cage, but also a large number of intrathoracic operations—lobectomies and pneumonectomies, as well as the five total esophagectomies previously mentioned—and am able to say that peridural anesthesia is truly the anesthesia of choice and is irreplaceable in this field. I use the novocain-pantocain formula and inject 40 to 50 cc. between the 1st and 3rd dorsal vertebrae. With it one obtains total insensibilization of the neck, thorax, superior extremities and part of the abdomen, without loss of motility. The anesthesia is of sufficient duration (1½ to 2 hours) to permit all major intracavitary procedures; it does not interfere with the patient's respiration; and it produces only a slight reduction in blood pressure, which is easily controlled with ephedrin, veritol, etc. Hyperpressure inhalation anesthesia, on

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the other hand, is unsuitable because the distended lung interferes with the operative maneuvers. The advantages of peridural over general anesthesia are such that I have completely dispensed with the latter.

*Pneumothorax*—Arce's preliminary pneumothorax<sup>1</sup> is essential. Operative facility is greatly increased by having the lung collapsed and quiet against the hilus.

*Approach to the Esophagus*—A study of the relationships of the thoracic esophagus shows, in my opinion, that the approach unquestionably should be from the right side. If approached from the left side, it is extremely difficult to section the esophagus and to obliterate its stump with a purse-string suture in the narrow space between lung and heart in front, the inferior vena cava to the right and in front, and the descending aorta behind. Further, having reached the level of the arch of the aorta, one must work beneath and behind it in order that the esophagus may be removed through the superior mediastinum, with the added hazard of damage to the recurrent laryngeal nerves and the thoracic duct. Figure 1 reproduces a drawing of an anatomical preparation made at our department, showing the relationships of the thoracic viscera and the

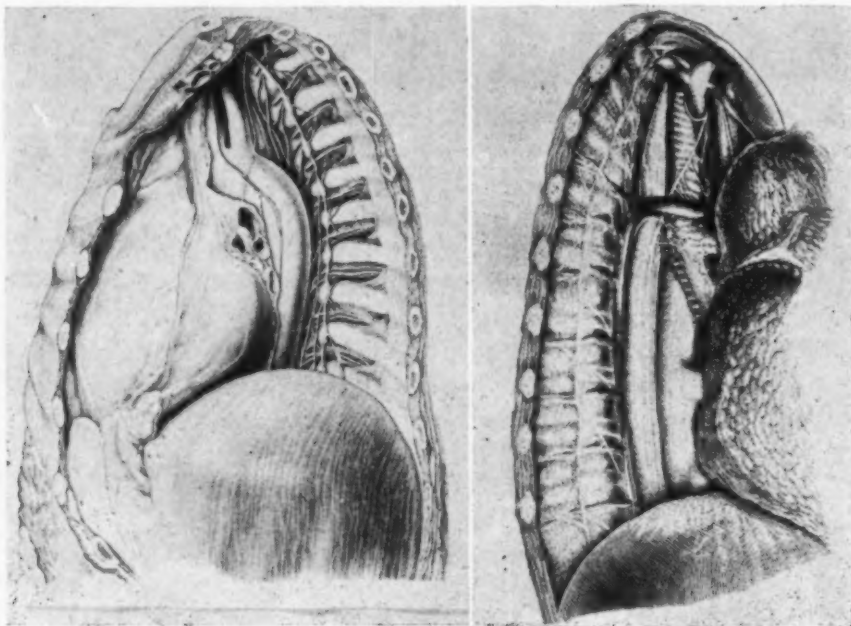


Fig. 1

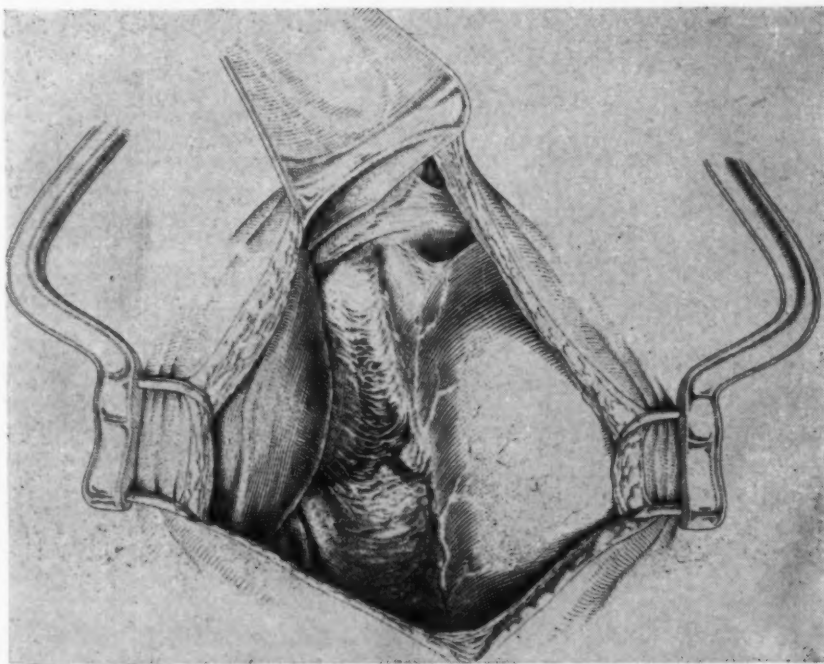
Fig. 2

Fig. 1—Topography of the thoracic viscera. Left hemithorax. (Preparation and drawing from the Department of Surgical Technique, Faculty of Medicine of the University of Sao Paulo.) Fig. 2—Topography of the thoracic viscera. Right hemithorax. One sees the thoracic portion of the esophagus in practically its entire length, crossed only by the vena azygos major and the right bronchial artery.

difficulties to be overcome when the approach is from the left side.

Approach through the right hemithorax is incomparably more simple and less serious, because the esophagus, in its thoracic portion, is situated more to the right than to the left. Beginning at the left in the neck, it penetrates the thorax in an oblique direction to the right, descends to the right of the median line, and enters the hiatus of the diaphragm at the median line. Figure 2 reproduces a drawing which clearly shows the relationships of the thoracic esophagus and its inclination to the right. Once the lung is drawn aside and the mediastinal pleura incised, the esophagus may be seen in practically its whole extent, since it is not hidden by the aorta or the heart. The pneumogastric and recurrent nerves are easily seen. It is crossed only by the vena azygos major, which empties into the superior vena cava, and by the bronchial artery.

On this side it is usually a simple matter to free the esophagus from its bed and to slip it upward behind the vena azygos, at the same time detaching any adhesions between trachea or bronchi and the esophagus. If technical conditions warrant ligation and severance of the azygos vein in order to facilitate isolation of the esophagus, as in my last case, this can be accomplished easily. In this case the malignant zone was tightly adherent to the trachea, from which, however, it was easily separated. I am sure that had the approach been made from the left side it would have been



*Fig. 3*—Median incision, left lobe of the liver retracted. View of the cardia and abdominal esophagus.

impossible to separate the adherent organs and to complete the extirpation.

*Gastrostomy*—Any of the techniques previously used for gastrostomy have two inherent disadvantages: (1) A simple procedure gives an incontinent ostium; and the more difficult procedures, like Janeway's,<sup>2</sup> DePage's,<sup>3</sup> or Spivack's,<sup>4,5</sup> which utilize a portion of the stomach wall to construct a mucosa-lined tube—in my opinion only the last gives a really continent ostium—have a significant mortality coefficient. (2) Section of the esophagus is done in the thorax, opening the way for infection of the pleura and, according to many surgeons, requiring a drain in the cavity to forestall the development of empyema. Besides, placing a purse-string suture and securing tight closure of the remaining stump of esophagus in the depths of the thorax calls for considerable technical ability.

After working out the technique on cadavers I was able to verify in patients the conclusion that it is much easier, and from every point of view preferable, to section the esophagus below the diaphragm in the first operative stage, closing the superior extremity and implanting the end of the abdominal portion in the skin.

This method has three important advantages: (1) Section and closure of the esophagus is incomparably easier through the abdomen than through the thorax. (2) A tube for implantation into the skin is ready-made, obviating a gastrostomy entirely. By making a

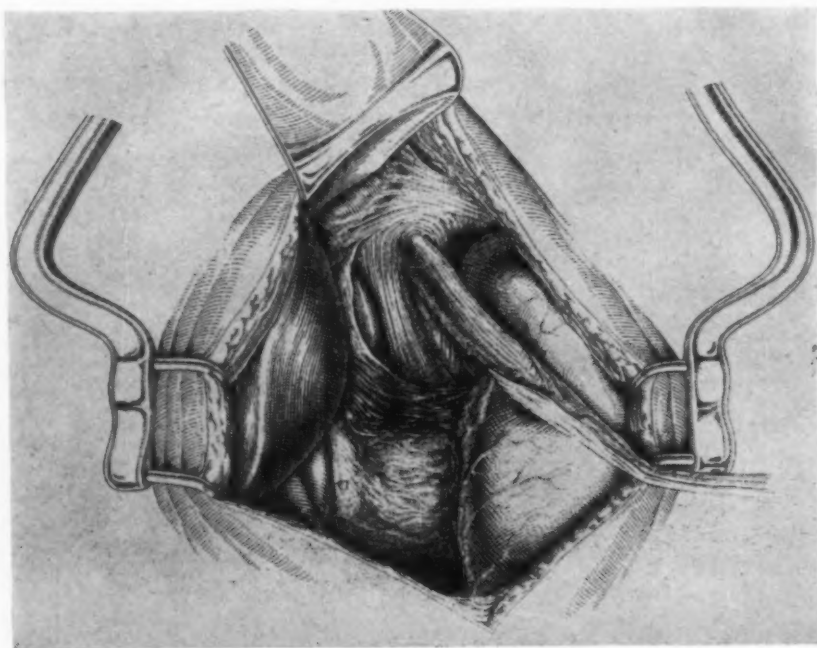


Fig. 4—View of the esophageal hiatus of the diaphragm. Esophagus held in a loop of gauze.



seromuscular fold at the base of this tube, as in Spivack's gastrotomy,<sup>4</sup> one obtains an ostium which is absolutely continent, as I had the opportunity of verifying in animals and in the last case I operated. The patient was told to contract the abdominal muscles, or to cough, immediately after 500 cc. of liquid had been placed in the stomach; and none of it escaped through the ostium. (3) The chief advantage, and the real purpose of the new technique, is that it permits an absolutely aseptic thoracic stage, since the digestive tube is not opened in the thorax. Inasmuch as the thoracic stage is shortened, intrathoracic manipulation is reduced, and the chief source of contamination—the only source, when one maintains a strictly aseptic technique—is eliminated, operative mortality and postoperative complications should be greatly reduced.

#### OPERATIVE TECHNIQUE

*Abdominal Stage*—A median xiphoid-umbilical incision is used. Having put the Gosset retractor in place, one looks for the cardia. It is easily seen when the left lobe of the liver is retracted (Fig. 3). After incising the peritoneum which covers the abdominal esophagus, one sees clearly the pillars of the diaphragmatic hiatus. A strip of gauze is then looped around the esophagus, by means of which traction is made and the esophagus is drawn down through the hiatus for a distance of 6 to 8 centimeters (Fig. 4). It is then sectioned between two ligatures and an "enfuissement" is made in the superior extremity. The hiatus is closed over the stump with 2 or 3 stitches (Fig. 5).

The upper portion of the stomach is mobilized and its coronary ligament sectioned, which frees the abdominal esophagus and per-

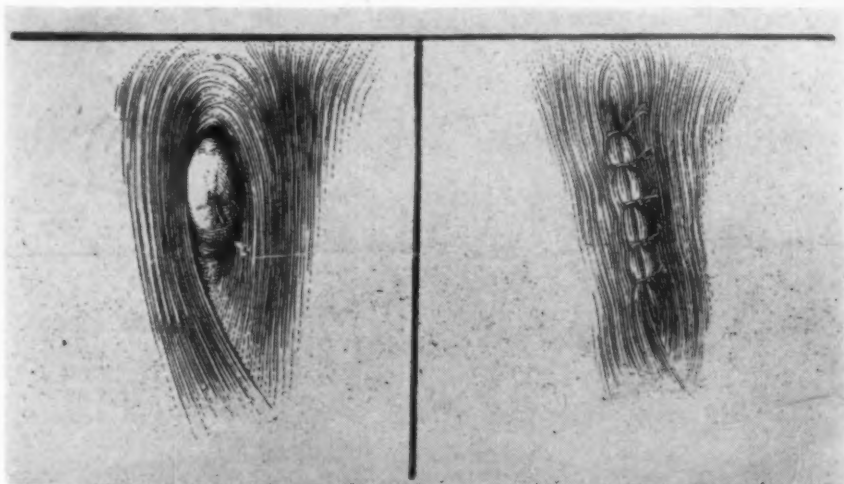


Fig. 5—Closure of the esophagus with a purse-string suture. Approximation of the diaphragmatic pillars with stitches.

mits it to be brought up to the anterior abdominal wall. A sero-muscular pleat is made in the esophago-gastric passage, so as to create a valve facing the opening (Fig. 6).

A vertical transrectal incision 3 to 4 centimeters long is made close to the left costal border. The fundus and anterior wall of the stomach are sutured to the abdominal wall with separate stitches to provide support. The esophageal tube is passed through the transrectal opening and the mucosa is carefully sutured to the skin with interrupted stitches to secure perfect approximation (Fig. 7).

The patient is given eight to ten days to recover from this operation, being fed and hydrated at the same time. During a second period of ten days Arce's preliminary pneumothorax is established in preparation for opening the thorax.

*Thoracic Stage*—Incision is made over the 6th rib from the external border of the paravertebral musculature to a little above the chondrocostal junction in front. The 6th rib is removed by subperiosteal resection, the pleura is opened through the rib bed, and the wound spread with a large Sauerbruch retractor.

The collapsed lung is retracted forward and the mediastinal pleura incised vertically, posterior to the lung root. Thus the entire thoracic esophagus is exposed, crossed only by the azygos vein and the bronchial artery. Since the inferior extremity is already sectioned and closed, it is necessary only to free it from its bed of loose connective tissue. On reaching the level of the azygos vein, the

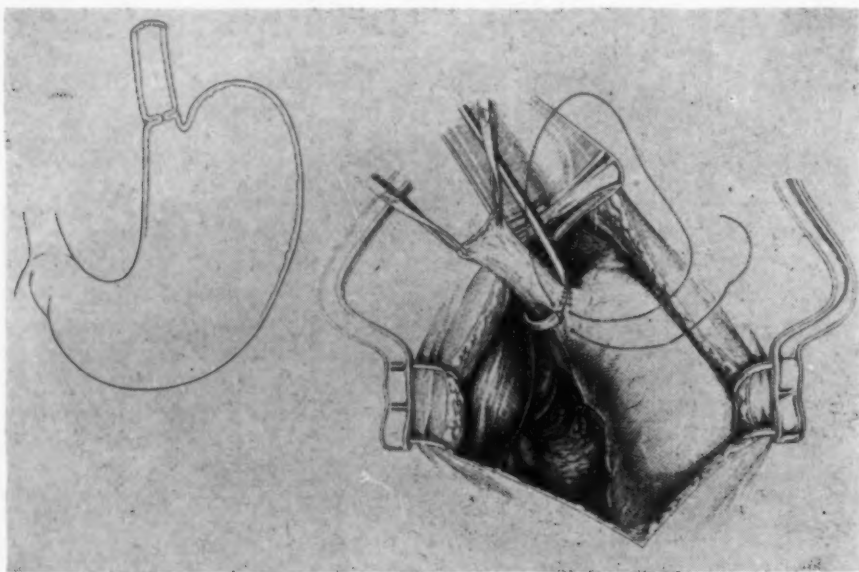


Fig. 6—Technique of cardiostomy. Abdominal esophagus sectioned. Stomach mobilized by section of the coronary ligament. Fashioning the circular sero-muscular pleat at the esophago-gastric junction. Sketch to show the valve mechanism.

technical conditions will determine whether it is preferable to ligate and section this vessel or whether the esophagus can be mobilized sufficiently to remove it from beneath the intact vessel. Adhesions to the trachea and the bronchus can be separated under direct visual control. Detachment of the esophagus from its bed should reach the level of the neck on the first rib.

The thorax is closed without drainage.

*Cervical Stage*—At this level the esophagus is more easily reached from the left side, and such an approach has no disadvantages in relation to the thoracic wound on the right.

The patient is placed in dorsal decubitus. An incision 8 to 10 centimeters long is made along the anterior border of the sternocleido-mastoid muscle, and the underlying muscles are separated and retracted until the esophagus is reached. In some cases its exposure is facilitated by ligation of the inferior thyroid vessels. When the esophagus is adequately exposed it is drawn out through the wound and the musculo-aponeurotic layers approximated with separate stitches. Just before closure is completed the inhalation apparatus should be applied and the lung re-expanded with positive pressure, to insure the benefit of maximum pulmonary ventilation. The esophagus is fixed to the borders of the cutaneous orifice with non-penetrating interrupted sutures. Before sectioning the esopha-

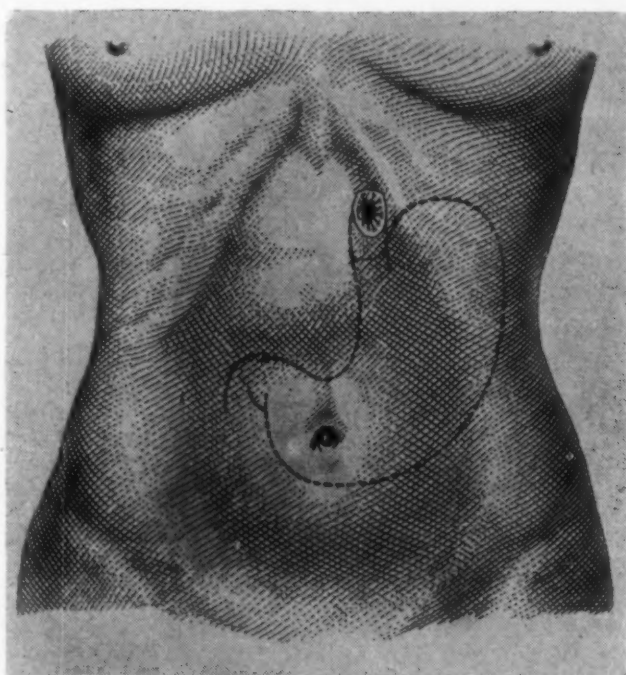


Fig. 7—Drawing of the cardiostomy.

gus I prefer to close the proximal end with a silk tie to prevent saliva flowing over the operative wound, macerating it and making it liable to infection. Such closure has the advantage of keeping the wound dry for 4 to 5 days, time enough for healing to have taken place.

Figure 8 is the photograph of a patient one and one-half months after esophagectomy by the technique just described.

This new technique, in my opinion, completely alters the prognosis of total extirpation of the esophagus, permitting a more optimistic attitude, because of the reduction in complications and mortality rate of this serious surgical procedure.



*Fig. 8*—Patient one and one-half months after total esophagectomy by the author's technique. Notice the orifices of the esophagectomy and of the cardiostomy.



## SUMMARY

A review of the literature on the subject of total esophagectomy for cancer shows that experience in this field is relatively small, and that only in the last few years have results begun to offer encouragement.

The author describes and illustrates in detail a new technique for total esophagectomy. Peridural is preferred to general anesthesia. The operation consists of an abdominal, a thoracic, and a cervical stage. A preliminary artificial pneumothorax is established in the interval between the abdominal and the thoracic stages. This is considered to be an essential preparation before opening the thorax.

In the opinion of the author, this new technique completely alters the prognosis of total extirpation of the esophagus and permits a more optimistic attitude because of the reduction in complications and mortality rate.

## RESUMEN

El repaso de la literatura sobre la materia de la esofagoectomía total para el cáncer revela que la experiencia en este campo ha sido relativamente escasa, y que sólo ha sido en los últimos pocos años cuando los resultados han comenzado a ser alentadores.

El autor describe e ilustra en detalle una nueva técnica para la esofagoectomía total. Se prefiere la anestesia peridural a la anestesia general. La operación consiste de tres etapas: abdominal, torácica y cervical. Se lleva a cabo un neumotórax artificial preliminar en el intervalo entre la etapa abdominal y la torácica. Esta es una preparación esencial antes de abrir el tórax.

Opina el autor que esta nueva técnica altera por completo el pronóstico de la extirpación total del esófago y nos permite asumir una actitud más optimista debido a la disminución de las complicaciones y la mortalidad.

## SUMARIO

O Autor, depois de estudos em cadaver e de cinco operacoes no vivo, propoe uma nova técnica, com os seguintes pontos fundamentais:

- 1) Anestesia peridural.
- 2) Pneumotorax prévio de Arce.
- 3) Via de acesso pelo lado direito, mostrando em côrtes e desenhos originais que o trajeto do esofago e muito mais a direita do que á esquerda em seu segmento torácico, e por aí muito mais facilmente abordado.

Incisao ao longo da 6ª ou 7ª costela, conforme o tipo morfológico do doente. Acesso ao esofago cervical pela esquerda, o que facilita a extirpacao a esse nivel.

Os pontos fundamentais da técnica são:

1º tempo—Incisão xifo-umbilical. Secção do esôfago abdominal com fechamento da extremidade superior. A extremidade inferior é tratada de modo a se obter uma válvula músculo-mucosa conforme indica a fig. 6.

Cardiostomia cutânea paramediana esquerda, como mostra a fig. 7.

2º tempo—Ao cabo de 15 a 30 dias, esofagectomia pelo hemitorax direito.

Vantagens da técnica: Muito maior facilidade da secção e sutura do esôfago por via torácica. Cardiostomia continente, aproveitando-se a incisão abdominal para os dois tempos, tanto esofágico como gástrico.

A via do hemitorax direito é muito mais fácil pelas relações anatómicas do que pela esquerda. A' direita, como se vê na fig. 2, o esôfago está exposto em quase todo o seu trajeto torácico, recoberto quase que só pela pleura. Fundamental vantagem é a esofagectomia asséptica através do tórax, o que representa, a nosso ver, a maior vantagem do método.

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## Lower Lung Field Tuberculosis\*

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It is a well-known fact that the roentgenological manifestations of the reinfection or adult type of pulmonary tuberculosis are usually first noted in the apical and infraclavicular regions of the lung. Persistent rales in the upper chest, along with hemoptysis, x-ray findings, pleurisy and positive sputum, are considered as the criteria for a clinical diagnosis of pulmonary tuberculosis. Tuberculous involvement of the lower lung fields was previously considered so infrequent that such a diagnosis was rarely ever made. As a matter of fact, as late as 1921, Landis<sup>1</sup> stated, "My opinion concerning basal tuberculosis is still unchanged; children may have it at the base, but adults practically never." Fishberg<sup>2</sup> in 1922 stated, "Basal lesions in tuberculous patients are extremely rare; when they do occur they are terminal phenomena, when the diagnosis is beyond question. A lesion at the base, while the apex is free, should be considered non-tuberculous unless the sputum is positive as regards tubercle bacilli."

On the other hand, Kidd<sup>3</sup> (1886) stated that "The apex of the lower lobe is very prone to (tuberculous) disease and may be attacked before the apex of the upper lobe." Fowler<sup>4</sup> (1888) stated: "The upper and posterior part of the lower lobe is a spot only second in point of vulnerability to the apex itself." Furthermore, Fishberg<sup>5</sup> in the next edition of his book (4th ed.) in 1932 changed the above mentioned statement to read: "Basal lesions in tuberculous patients are extremely rare; when they do occur they are of the exudative variety and as such clearly seen on roentgen film."

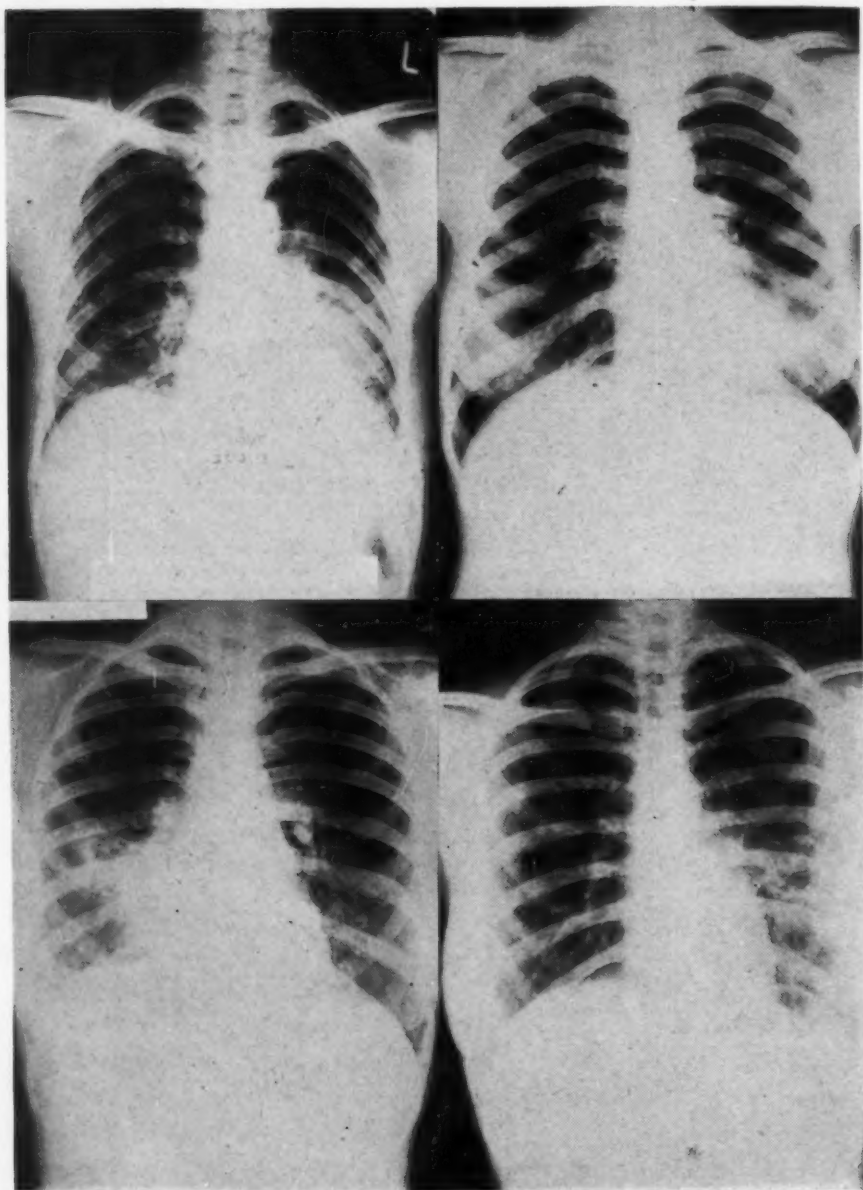
More recently, a number of authors<sup>6,7,8,9,10,11,12,13,14</sup> have concluded that although much less frequent, the lower lobes may be the initial site of chronic pulmonary tuberculosis. We have found tuberculous involvement in the lower lung fields often enough to warrant a review of the experience at Robert Koch Hospital.

### METHOD OF STUDY

This series is a roentgenographic study of over 2,000 consecutive discharges from February, 1933, to February, 1942. The first available film, which in most instances was taken prior to admission to

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this hospital, was studied. We excluded all cases in which infiltration was present in the upper half of either lung. We further excluded all cases of primary infection tuberculosis. All cases of bronchiectasis, pleural effusion or pleural thickening were also discarded, unless there was concomitant tuberculous parenchymatous involvement. Only those cases in which the disease was confined to the lower half of the lung was considered. Plates 1 and 2 illustrate typical cases chosen. Unfortunately, during this period



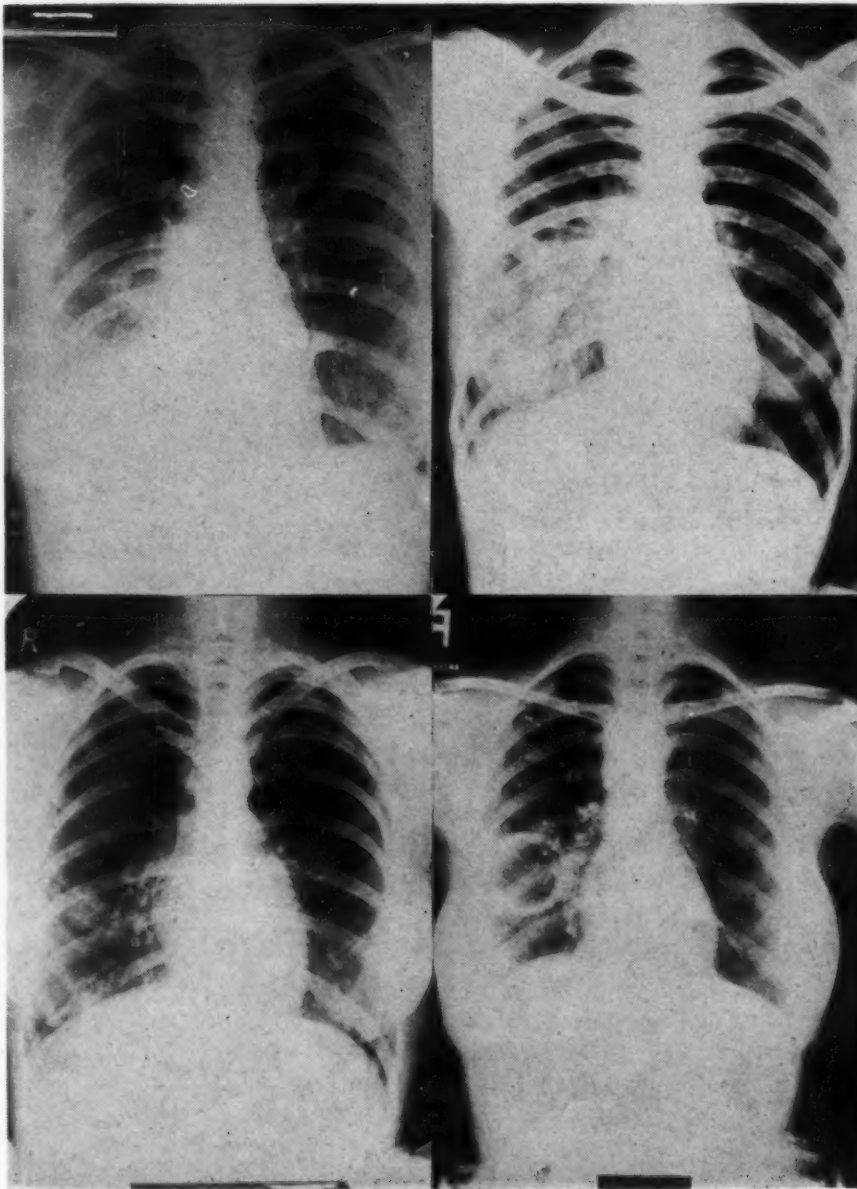
*Plate I*—Typical cases selected.



very few films in the lateral positions were being taken; therefore, we designate our cases as lower lung field tuberculosis rather than lower lobe tuberculosis, which most of them probably are.

#### PREVALENCE

There were 2,354 cases of pulmonary tuberculosis discharged from this hospital between February, 1933, and February, 1942. Of these, 63 satisfied our criteria for lower lung field tuberculosis, giving an

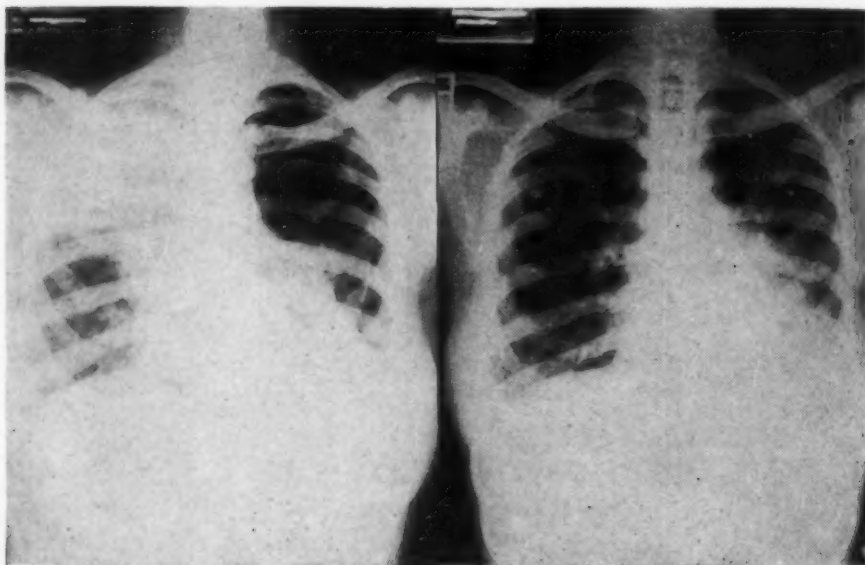


*Plate II—Typical cases selected.*

incidence of 2.7 per cent. In the literature there is much variation in the reported incidence, varying from 0.003 per cent<sup>15</sup> to 18.3 per cent.<sup>7</sup> The majority of the figures fall between 1.5 per cent and 5 per cent. The authors who gave the low figures reviewed series from large municipal sanatoria where the patients are usually first seen in an advanced stage of their disease. On the other hand, the authors working with smaller and more select groups seen early, report the higher incidence. For example: Ross,<sup>7</sup> who reported an incidence of 18.3 per cent was following a group of nurses and probably discovered their disease in the very early stages. The reason for these differences is that tuberculosis of the lower lung fields can be diagnosed as such only in the earlier stages before spreads to the upper fields have occurred.

Cases 1 and 2 demonstrate such instances. The films taken on admission appeared as ordinary chronic pulmonary tuberculosis. However, on going back to the first available films on these patients, we noted that the disease quite definitely originated in the lower lung field. Undoubtedly more such cases, where the earlier x-rays were not available, escaped our attention. Otherwise, our incidence would no doubt have been higher.

**Sex**—Of the 63 cases, 44 (69.8%) were female and 19 (30.2%) were male. Since the general proportion of female to male in this hospital during this period is approximately 1 to 1, these figures are significant. This is the usual experience of all observers. All report a



*Fig. 1a*

*Fig. 2a*

*Fig. 1a*—Case 1, L. G., 23-year-old negro female. Film taken on admission to hospital. *Fig. 1b*—Case 1, L. G. Film taken at the clinic about 8 months prior to admission.

preponderance of female over male.<sup>8,9,10,11,12</sup> The explanation for this is obscure. An explanation has been offered by Reisner<sup>6</sup> based on the supposed differences in the type of respiration between males and females.

*Color*—We have noted no definite differences in the incidence between white and negro patients. In our group there were 43 (68.2%) whites and 20 (31.8%) negroes. These figures approximate the general proportion of white to negro in our hospital during this period. Weidman and Campbell<sup>9</sup> report similar findings; however, Dunham and Norton<sup>13</sup> claim a markedly greater prevalence among the negroes.

*Age*—The ages of our patients varied between 15 and 58 years. There were 49 cases (91.5%) under 40 years of age. Among the negroes, however, 90 per cent were under 30 years, the oldest negro being 33 years. Reisner,<sup>6</sup> Ross<sup>7</sup> and others<sup>9,11,12,13</sup> have also found a prevalence of lower lung field tuberculosis among the younger age group.

#### EXTENT AND DISTRIBUTION OF DISEASE

*Side*—Some authors<sup>6,9,11,12,14</sup> report a preponderance of initial involvement on the right side. We, however, have not noted any marked prevalence on any one side. There were 37 (58.7%) of the cases on the right side and 26 (41.3%) on the left.

*Degree of Involvement*—Of the 2,291 cases of the usual type of

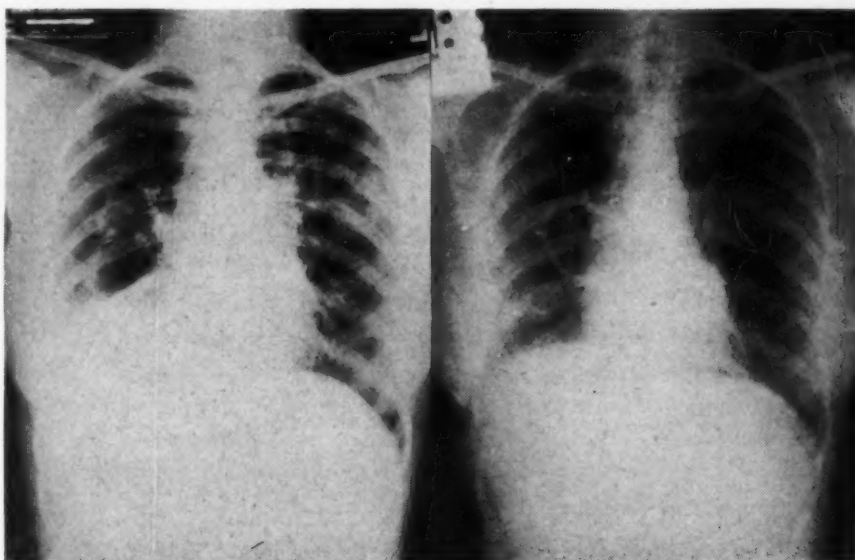


Fig. 2a

Fig. 2b

Fig. 2a—Case 2, V. M., 25-year-old white female. Film taken on admission to hospital. Fig. 2b—Case 2, V. M., film taken by her private physician about 6 months prior to admission.

pulmonary tuberculosis reviewed, there were 1,672 (72.9%) far advanced; 518 (22.6%) moderately advanced; and 101 (4.4%) minimal. In the cases showing lower lung field disease there were 39 (61.9%) far advanced; 24 (38.1%) moderately advanced and no minimal cases. This was undoubtedly due to the fact that minimal tuberculosis in the lower lung field went unrecognized and, therefore, was not hospitalized. In our group, the percentage of moderately advanced was somewhat higher than for the ordinary type because after the case spread to become far advanced, the lower lung field origin very often cannot be definitely ascertained.

*Pathology and Symptomatology*—In respect to the mode of onset, symptoms and duration of disease prior to admission, we have found no essential differences between those cases in our series and the usual form of pulmonary tuberculosis. The majority of the cases had cavitation. All but one had a positive sputum. Over 75 per cent had a history of blood-spitting. This last figure would seem to be somewhat higher than usually seen.

#### TREATMENT AND PROGNOSIS

The end results in this group show that one-third (21 patients) were discharged as arrested; approximately one-third (20 patients) died, and approximately one-third (22 patients) left the hospital as quiescent, improved or unimproved. These, in general, are the same as the end results obtained in the usual type of pulmonary tuberculosis at this hospital. Of the series 44 (2/3) had received collapse therapy in some form: Pneumothorax, phrenic paralysis, thoracoplasty, pneumoperitoneum, or some combination. Of these again, the same end results were obtained, a third (15 patients) were arrested, approximately a third (11 patients) died, and approximately a third (18 patients) were quiescent, improved or unimproved. It is interesting to note that of the four cases receiving thoracoplasty, only one became arrested. In this instance the thoracoplasty was begun with the lower ribs and continued upward. Freedlander<sup>16</sup> reports three such thoracoplasties, all with good results. It is quite generally accepted that cavities in the lower lobe, especially in the superior division, are not very amenable to surgical collapse by thoracoplasty. Of the 19 which did not receive collapse therapy, about a third (6 patients) were arrested and a half (10 patients) died. The slightly higher death rate in this latter group was probably due to the fact that some of these patients were too sick on admission for collapse therapy.

#### CONCLUSIONS

- 1) In the differential diagnosis of lesions occurring in the lower lung field, tuberculosis should be given due consideration.



2) In a review of the discharges over a period of nine years, at least 2.7 per cent of the cases originated in the lower half of the lung.

3) Many cases of lower lung field tuberculosis escape recognition because, when first seen, spread to the upper half has already occurred.

4) Females are more likely to have lower lung field tuberculosis in the ratio of approximately 2 to 1.

5) No notable deviations from the usual were observed in regard to race, symptomatology, duration of disease, pathology and prognosis.

6) The indications for collapse therapy are the same as for the usual form of pulmonary tuberculosis. However, in an occasional case, retrograde thoracoplasty may give good results.

#### CONCLUSIONES

1) La tuberculosis debe recibir debida consideración en el diagnóstico diferencial de las lesiones que aparecen en la zona pulmonar inferior.

2) En un repaso de los rechazos durante un período de nueve años, la enfermedad se originó en la mitad inferior del pulmón en, por lo menos, el 2.7 por ciento de los casos.

3) Muchos casos de tuberculosis de la zona pulmonar inferior pasan desapercibidos porque, cuando se ven por primera vez, ya ha tenido lugar propagación a la mitad superior.

4) La tuberculosis de la zona pulmonar inferior es más frecuente en las mujeres que en los hombres en la razón del 2 a 1.

5) No se observó desviaciones de lo común dignas de atención, en cuanto a raza, sintomatología, duración de la enfermedad, patología y pronóstico.

6) Las indicaciones para la colapsoterapia son las mismas que en la forma usual de la tuberculosis pulmonar. Sin embargo, en ciertos casos la toracoplastia retrógrada puede dar buenos resultados.

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## The Diagnosis of Bronchiectasis: Clinical and Roentgenological Observations\*

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### HISTORY

Considerable progress has been made during the past decade in the diagnosis of bronchiectasis. Intensive clinical study, supplemented by improved radiographic apparatus and technique, and advanced methods of bronchoscopy and bronchography have demonstrated that bronchiectasis is a fairly common disease, subject to early diagnosis. Hedblom considers it the "most common disease of the lungs second to tuberculosis."

Although bronchiectasis in its advanced stages has been known to clinicians and pathologists for a long time, the recognition of its earlier developmental phases dates back to the epoch-making researches of Sicard and Forestier.<sup>1</sup> They successfully visualized the bronchial tree by the instillation of radiopaque substances. This method, commonly practiced now, is termed bronchography. In the use of this procedure we have a reliable means of detecting the presence, location and extent of bronchiectatic disease. Iodized oil is the medium most commonly employed, although other substances are favored by some clinicians.

The early clinical and pathological studies in bronchiectasis were carried out by Unverricht,<sup>2</sup> Rist,<sup>3</sup> Singer and Graham,<sup>4</sup> Perkins and Burrell,<sup>5</sup> and Tilman.<sup>6</sup> Knowledge regarding bronchiectasis has been advanced in America by the work of Lillenthal,<sup>7</sup> Hedblom,<sup>8</sup> Graham,<sup>9</sup> Coryllos,<sup>10</sup> Eloesser,<sup>11</sup> Churchill,<sup>12</sup> Lloyd,<sup>13</sup> Andrus,<sup>14</sup> Overholt,<sup>15</sup> and others.

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\*A part of the material presented in this paper was studied by the authors during their association in the Thoracic Clinic, Beth Israel Hospital, Boston. Since entering upon an active duty status in the Army, one of us has had an opportunity to observe a number of soldiers with bronchiectasis. The latter was not detected at the induction center. Following a period of observation and study at a Station Hospital, these men were finally separated from the service on the basis of a Certificate of Disability. The opinions expressed in this paper are personal, and do not in any way reflect the opinion of the office of the Surgeon General of the United States Army.

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### ETIOLOGY

Bronchiectasis is found frequently in childhood and young adult life. While some consider its development on a congenital background, the majority of the writers on this subject believe that on the basis of clinical and pathological observations, bronchiectasis can be regarded as an acquired abnormality of the bronchi.

From the study of a considerable number of case histories, we noted that the majority of bronchiectatic lesions are traceable to any of the following pre-existing conditions: Recurring bronchial infection; chronic lobar and bronchiolar pneumonia; whooping cough complicated by pneumonia; acute and chronic lung abscesses; bronchial obstruction due to carcinoma; foreign body; and inflammatory cicatrix in the bronchial lumen caused by specific infection, like tuberculosis, as well as various non-specific infections. To a lesser extent, bronchiectasis may be the sequela of chronic empyema or lesions causing slow compression of a bronchus, leading to retention of secretion with subsequent infection. Thus, bronchiectasis may develop as the result of pressure by an aortic aneurysm and mediastinal or lung tumors. It may be anticipated, therefore, that bronchial infection with dilatation will occur in the distal portion of a bronchus whose lumen is obstructed either by an intrinsic or extrinsic cause. Influenza may be a predisposing factor in the subsequent development of bronchiectasis. As regards the latter, our findings are negative.

The relationship between the accessory nasal sinuses and the bronchi has raised considerable discussion. Many are of the opinion that chronic sinusitis must ultimately lead to the development of bronchiectasis; and, conversely, that sinus disease is expected to coexist in the majority of cases of bronchiectasis. In regard to this subject, while we feel that there may be in some instances a causal relationship between sinusitis and bronchial infection, our observations lead us to conclude that sinus disease is not a frequent concomitant of bronchiectasis.

### PATHOLOGY

The pathology of bronchiectasis, according to Kline,<sup>16</sup> consists of atrophy and destruction of the muscular and elastic tissues of the bronchial wall. In cases of long standing, complete disintegration may take place. Degeneration of the bronchial wall is considered by most observers as the basis for bronchial dilatation. The inflammation and necrosis in the bronchi extend beyond the confines of their walls, however, and in the advanced cases the infectious process invades the lung parenchyma resulting in true bronchopulmonary suppuration. Whittemore<sup>17</sup> stressed this a number of years ago.



Aside from the destructive changes found in the bronchial walls, leading to dilatation, the bronchi are subjected to a number of indirect forces which may be responsible factors in the development of bronchiectasis. These forces are pulmonary fibrosis, chronic cough, and lobar atelectasis. Exhaustive research leads Andrus to conclude that the first two factors are unimportant. He considers lobar atelectasis the most potent single mechanism that favors the development of bronchial dilatation.

#### DIAGNOSIS

The clinical manifestations in bronchiectasis depend upon the degree of pathologic evolution of the disease. The mild cases are characterized by slight cough, scanty or moderate amounts of sputum, no fetor in the breath, and rarely hemorrhage. The patient's general condition is good, and physical examination at times may reveal no abnormalities. Abnormal findings, when present, consist of diminished resonance and rales over the affected lobes. The diagnosis made in these cases is usually that of chronic bronchitis. Bronchography is likely to be omitted because bronchiectasis is not suspected. The mild forms of bronchiectasis are inevitably followed by the development of progressive changes. It is, therefore, important to establish a diagnosis in the early phases of the disease, so that ensuing complications could be looked for and suitable treatment planned.

In the far-advanced stages, bronchiectasis can be diagnosed quite readily. The clinical picture is apt to be severe. Cough may be constant and exhausting because of the ever-present secretion within the bronchiectatic cavities. The sputum is abundant and may be foul. Finger clubbing is more frequent. Varying degrees of hemorrhage may occur. The patient's vital capacity and physical reserve may be impaired. At this stage the lung parenchyma is involved as well. Should bronchopulmonary drainage become impaired, severe sepsis will supervene, characterized by chills, sweats, hyperpyrexia, and prostration.

#### COMPLICATIONS

In the advanced stages of bronchiectasis, any of the following manifestations may be present: hemorrhage, bronchopneumonia, atelectasis and empyema. Hemorrhage is common, and according to Hedblom, it occurs probably more often in this disease than it does in tuberculosis. Hemorrhage results from ulceration of the bronchial wall arteries. It may be slight, producing blood-streaked sputum, or severe enough to prove fatal.

Bronchopneumonia and bronchiectasis are frequent concomitants, the former occurring as a complication of the latter. How-

ever, this association is not commonly thought of, and is, therefore, easily overlooked. As a complication of bronchiectasis, bronchopneumonia presents characteristic clinical and roentgenologic manifestations, except that the patient is usually not toxic as compared with the primary type of pneumonia, and convalescence is usually quite rapid.

In a comprehensive study of a series of cases of bronchiectasis, Warner<sup>18</sup> notes an incidence of one attack of bronchopneumonia in fifty per cent of the cases, and an incidence of more than one attack in twenty-five per cent of the cases.

In offering an explanation of the mechanism responsible for this complication, Eloesser considers it due to the formation of mucous plugs in the infected bronchi, with resulting retention of secretion, favoring infection of healthy bronchi, thus inducing a bronchopneumonia.

Atelectasis is an important factor in the production of bronchiectasis, and occurs with relative frequency as a complication during its development. It results from obstruction in the bronchial lumen by inspissated secretion, or is due to the formation of cicatrix caused by chronic inflammation. The extent of the atelectasis depends upon the caliber of the obstructed bronchus, and upon the degree of occlusion. In this connection it should be mentioned that when the atelectasis becomes permanent, the involved lobe undergoes a diminution in size. Jones and Cournand<sup>19</sup> have named this abnormality as the "shrunk lobe," and have stressed the importance of its recognition in cases of chronic bronchial infection as an indication of a probable underlying bronchiectasis.

Empyema is a serious complication of bronchiectasis, and is comparable to the rupture of a lung abscess into the pleural cavity. In either instance, treatment consists of pleural drainage. It may be expected to occur in those cases of long standing bronchial infection that are accompanied by severe lung necrosis, inducing a perforation into the pleural space, resulting in a bronchopleural fistula.

#### RADIOGRAPHIC FINDINGS

The x-ray findings in bronchiectasis vary considerably, and the diagnosis of bronchiectasis based upon plain films is not conclusive. Yet the disease should be suspected when the following are present: (1) prominence of the bronchial markings, (2) rounded areas of increased radiance, the so-called "honeycombs," (3) lobar or lobular atelectasis, and (4) areas of mottled densities.

The radiographic shadows just mentioned are rather characteristic, and should be considered of diagnostic significance, especially when the history of the case is consistent with bronchiectasis. For the purpose of the present discussion, the term "mottled densities"

is used interchangeably with "pneumonic infiltration," such as appears in Table III. And further, the incidence of x-ray shadows, such as "bronchiectatic cavity with fluid," although not commonly mentioned among the radiographic shadows as suspicious of bronchiectasis, shows a considerable incidence in our series, while the findings of "pneumonitis with fluid" and "density resembling neoplasm" are of rare occurrence.

#### BRONCHOGRAPHY AND BRONCHOSCOPY

Bronchography is an important and reliable procedure in the diagnosis of bronchiectasis. In fact, it is the method of choice in examining cases which, either from the clinical history or ordinary radiographs, suggest the presence of a bronchiectatic lesion. Fluoroscopic examination is essential for the purpose of localizing the site of the lesion prior to the instillation of lipiodol, and to direct the latter into the proper bronchus by positioning the patient. "Spot" films during fluoroscopy give "close-up" views of the involved portions of the lungs. Lateral films are important to outline bronchial dilatations which may be obscured by the cardiac shadow in the postero-anterior view.

It should be stressed at this point that, in those cases in which clinical evaluation and radiographic findings warrant a diagnosis of probable bronchiectasis, and the terminal bronchi cannot be visualized on account of inspissated secretion and/or cicatricial stenosis in the main bronchus, preliminary bronchoscopy with suction will help to attain this end.

#### DIFFERENTIAL DIAGNOSIS

The principal conditions from which bronchiectasis is to be differentiated are tuberculosis, foreign body in the bronchus, bronchial carcinoma, and lung abscess. Tuberculosis may be mistaken for bronchiectasis because of cough, sputum, hemoptysis, and rales. These findings are especially apt to deceive the observer if rales are present in the apical portion of the lung. Foreign body, opaque or non-opaque, as has been shown by Jackson,<sup>20</sup> is not infrequently responsible for producing bronchopulmonary suppuration. Bronchoscopy is indispensable in locating foreign bodies, especially those which are non-radiopaque. Atelectasis is a common finding on the radiograph in the presence of foreign body. Carcinoma in the bronchial lumen favors retention of secretion. This in turn leads to infection, and ultimately, bronchial dilatation. In the experience of Graham, fully ten per cent of cases of bronchiectasis are found to have a concomitant primary bronchial or metastatic pulmonary neoplasm.

This observation carries the implication that in the presence of a

bronchiectasis, carcinoma should be suspected. Chronic suppuration due to lung abscess has a characteristic history: It begins acutely, following an episode of pulmonary complication after an operation, or it may be the aftermath of an acute respiratory infection, such as pneumonia. Moreover, abscess tends to develop with striking symptomatology; namely, hyperpyrexia, chills, sweats, and prostration. Bronchiectasis, on the other hand, usually develops slowly; and is rarely ushered in by violent symptoms.

#### PATHOLOGIC CLASSIFICATION

Bronchiectasis may be divided into four main types, depending upon the predominating pathology and its location:

1) Ulcerative bronchiectasis produces varying degrees of hemorrhage from blood streaks to amounts so large as to threaten life.

2) Stenotic bronchiectasis favors the development of atelectasis, which by virtue of its interference with bronchial drainage favors progression of the infection.

3) Fibrotic bronchiectasis is characterized by an abundance of peribronchial fibrosis. According to the theory propounded by Lloyd, this type tends to favor progressive bronchial dilatation in the presence of infection. He points out that pulmonary fibrosis produces a traction mechanism which is responsible for bronchial dilatation.

4) The "dry hemorrhagic" type of bronchiectasis. Pinchin and Marlock<sup>21</sup> have described a "dry hemorrhagic" type of bronchiectasis, and have offered the speculation that it develops on a congenital basis. The patients presenting this type of bronchiectasis usually have no cough or sputum, but are noted to suffer from recurring hemorrhage. Bronchial dilatation is found in this type of patient following the instillation of lipiodol. The authors have seen one case of hemorrhagic bronchiectasis in a middle-aged patient who appeared at the clinic because of several episodes of profuse hemoptysis. There was no history of respiratory disease or symptoms prior to the hemorrhage. Physical examination and radiography were negative. A bronchographic study revealed the presence of an extensive bronchial dilatation in the right middle lobe. We designated this case as one of hemorrhagic bronchiectasis, and felt it was on a congenital basis.

#### ANATOMICAL VARIETIES

Aside from the occasional fusiform bronchial dilatation observed, the two distinctive types most commonly observed are the cylindrical and saccular forms. Cylindrical bronchiectasis is the most common variety, and is found almost always in the base of the lung. The saccular type is found almost always in the upper portion of the



lung. Quoting Fleischner,<sup>22</sup> "Bronchial obstruction preceding the process of ectasia confines itself to the larger caliber bronchi in the dependent portions of the lung, while only the smallest bronchial branches are involved in the upper part of the lung. And, since drainage from the upper lobe is facilitated by gravity as contrasted with the poor drainage of secretion from the dependent portion of the lung, it follows that bronchial dilatation will be of the saccular type in the upper lobe, and cylindrical in nature in the lower lobe." It is of interest that the saccular type of bronchiectasis presents not infrequently on the plain films what appear like cavities filled with fluid, and show a fluid level. X-ray findings of this nature are designated as "bronchiectatic cavity."

#### EARLY DIAGNOSIS

Early diagnosis of bronchiectasis is important because in its early developmental phases the disease is apt to be unilobar and/or unilateral. Besides, advanced disease tends to produce serious complications, such as severe hemorrhage, parenchymatous abscess formation with profound sepsis, and empyema caused by bronchopleural fistula resulting from severe lung necrosis. A delay in the diagnosis of the early cases makes the treatment of advanced cases difficult and unsatisfactory on account of their low vital capacity and poor physical reserve. On the other hand, cases of bronchiectasis in their more favorable stages can be treated more effectively and with a low operative mortality rate by the accepted methods of surgery.

#### EVALUATION OF MATERIAL

Our observations are based upon a study of an unselected group of cases of bronchiectasis occurring in military as well as civilian practice. Visualization of the bronchi was confined to bronchography, except in those cases that presented difficulty in lipiodol instillation, evidence of atelectasis, or suspicions of neoplasm. In the latter, bronchoscopy with aspiration of secretion was performed prior to the instillation of lipiodol.

The clinical material observed was subjected to the following analyses: antecedent history of respiratory disease, such as whooping cough, pneumonia, bronchitis, empyema and influenza; the presence of rales, hemoptysis, clubbing of the fingers, foul sputum, evidence of bronchopneumonia; coexisting sinusitis, bronchial asthma, and carcinoma; evidence of atelectasis, neoplasm, and anatomical involvement.

The ages of the patients varied between twelve and sixty-five years. The total number studied is sixty-two cases.

The following tables illustrate the observations made in a combined group of military and civilian cases, a total of sixty-two cases.

However, in the military component, because of the transfer of seventeen cases, out of a total of thirty-two studied, to a Veterans' Hospital for further care, it was possible to evaluate clinically only fifteen cases. Hence, in Tables I and II the study of the incidence

TABLE I  
ANTECEDENT EPISODES OF RESPIRATORY DISEASE\*

<i>Probable Etiology</i>	<i>Time of Occurrence</i>	<i>Case Incidence</i>	<i>Per Cent</i>
Chronic Cough	Adult Life	12	26
Pneumonia	Childhood	7	
	Adult Life	7	
	Total	11	24
Chronic Bronchitis	Adult Life	9	20
Chest Colds	Adult Life	6	13
Whooping Cough	Childhood	4	8
Empyema	Childhood	2	
	Adult Life	2	
	Total	4	8
Pneumonia with Empyema	Childhood	2	4
Whooping Cough with Pneumonia	Childhood	1	2

\*Table represents the combined military and civilian case histories, a total of forty-five.

TABLE II  
CLINICAL FEATURES\*

<i>Clinical Pathology</i>	<i>Case Incidence</i>	<i>Per Cent</i>
Rales	42	93
Bronchopneumonia	(once)	7
	(many times)	13
	Total	20
Hemoptysis	16	33
Clubbed Fingers	7	15
Foul Sputum	6	13
Sinusitis	6	13
Bronchial Asthma	5	11
Bronchial Carcinoma	3	6

\*Table based upon a total of forty-five cases. The concomitant conditions of sinusitis, bronchial asthma, and bronchial carcinoma were not encountered among the military cases in this series.

of clinical features in the military group added to thirty cases in the civilian group makes for a total of forty-five. Analysis of data in Tables III and IV is based upon a total of sixty-two cases. A detailed discussion of the pertinent data noted in the military cases whose clinical records are available will be presented when bronchiectasis found in the armed forces is discussed in another part of this paper.

TABLE III  
RADIOGRAPHIC FINDINGS—PLAIN FILMS\*

Pathology	Civilian	Army	Total	Per Cent
Increased Bronchial Markings	30	17	47	74
Honeycombs	5	7	12	19
Atelectasis	7	4	11	17
Bronchiectatic Cavity with Fluid	9	0	9	14
Pneumonic Infiltration	4	1	5	8
Pneumonitis with Fluid	1	0	1	1
Density Resembling Neoplasm	1	0	1	1

\*Total number of cases analyzed—sixty-two; thirty-two are military, thirty are civilian.

TABLE IV  
INCIDENCE OF ANATOMICAL INVOLVEMENT\*

Location	Civilian	Military	Total	Per Cent
Left lower lobe	18	14	32	50
Right lower lobe	7	13	20	31
Right middle lobe	3	5	8	12
Bilateral lower lobes	3	8	11	16
Right upper lobe only	None	None	None	None
Left upper lobe only	None	None	None	None
Bilateral apical	1	None	1	1

\*Analysis is based upon a total of sixty-two cases; thirty-two military and thirty civilian.

#### DISCUSSION OF TABLES

In Table I we note a considerable incidence of respiratory disease antedating the present illness, occurring in infancy and childhood. Also, the clinical manifestations in the past history, in the order of greatest frequency, were chronic cough, pneumonia, chronic bronchitis, chest colds, whooping cough and empyema. It is apparent that not only is chronicity the keynote in the development of

bronchiectasis, but it is also a guide in the evaluation of those chest conditions that may appear innocuous clinically at the time of initial contact with the patient.

In Table II the constancy of rales in nearly all of the cases examined (93%) is noteworthy. The latter finding is important when rales persist for a long time after convalescence is established, and should make one suspicious of the presence of a chronic bronchial infection. As regards the occurrence of bronchopneumonia manifestations, as stressed by Warner, we found a considerable incidence of this clinical feature. It is obvious that, unless the past history in a case of apparent bronchopneumonia is looked into, the relatively rapid recovery of the majority of these may lead to an erroneous conclusion, namely, that the case was one of an uncomplicated nature; that it was primary in character. In the case of the soldier it will mean return to duty at an early date, only to continue with the symptoms antedating the present illness. Inevitably, this soldier will re-enter the hospital at some future date with a recurrence of chest difficulty. Such hospital readmissions can contribute to a disruption in the company or battery organization, should the patient involved be a non-commissioned officer holding a key job.

As regards hemoptysis, the occurrence of this clinical feature in fully one-third of the cases stresses not only the importance of this symptom as a guide in diagnosis, but also the frequency of hemorrhage that is seen in bronchiectasis and not generally appreciated.

Clubbing of the fingers and foul sputum are relatively infrequent, although the general opinion is that these clinical features are of common occurrence in advanced bronchiectasis.

In our series we found the incidence of concomitant sinusitis relatively low, notwithstanding the frequently expressed opinion to the contrary. It can be stated that in our observations there was a definite lack of relationship between accessory nasal sinus disease and bronchiectasis, insofar as the former causing the latter is concerned. Moreover, our series of bronchiectasis was complicated by sinusitis in a very small proportion of the cases, and the pathology by x-ray consisted of only thickened mucous membrane with no outstanding clinical symptomatology.

Bronchial asthma was observed in five cases. These occurred in civilians, and we have no reason to believe that it was in any way contributory to the establishment of the bronchiectasis.

Bronchial carcinoma was a concomitant finding in three cases. It occurred in the civilian component of the group studied. Moreover, although the causal relationship between the tumor and the bronchiectatic disease is not definitely known in these cases, a possible relationship is obvious, as stressed by Graham.



Analysis of Table III throws light on some of the important radiographic signs to be looked for on the plain films in cases suspected of having bronchiectasis clinically, as pointed out by Andrus. "Increasing bronchial markings" is the outstanding finding and is of greatest frequency. In fact, at times the greatest amount of bronchial disease makes itself evident on the plain films only in the form of an increase in the bronchial markings. The radiographic shadows designated as "honeycombs" show a considerable incidence. The presence of these honeycomb shadows is nearly always indicative of advanced disease. Atelectasis was present in nearly one-fifth of the cases, a fair incidence. The presence of what is designated as "bronchiectatic cavity" with fluid points to two important elements in the pathology of the disease, namely, severe dilatation in the bronchus affected, and the phenomenon of accumulation of mucopurulent secretion to a degree that it resembles a pulmonary abscess cavity. The occurrence of shadows designated as "pneumonic infiltration" is pertinent from the standpoint of differential diagnosis, because this finding in the presence of symptoms consistent with an acute lung infection could lead to an erroneous assumption that we are dealing with an uncomplicated pneumonitis. Shadows of this nature are generally caused by an extension of the infectious material from previously infected bronchi into healthy bronchi, inducing infection and a concomitant lobular atelectasis.

The rare finding of "pneumonitis with fluid," in one case out of sixty-two, points to the radiographic appearance of bronchopulmonary pathology in a case of bronchiectasis that has extended into the lung parenchyma, producing a pneumonitis with an abscess cavity. This is the most severe form of parenchymatous extension from a pre-existing bronchiectasis. In this type of case, if the pathology persists long enough, we expect to find foul sputum and/or finger clubbing. Clinically, this is the type of patient that is apt to present symptoms of severe bronchopulmonary sepsis, characterized by hyperpyrexia, chills, sweats and prostration.

Lastly, the finding of "density resembling neoplasm," an incidence of one out of sixty-two cases, points to a pathological entity resulting from two factors, namely, an atelectasis due to bronchial obstruction and an accompanying pneumonitis. A differential diagnosis can generally be arrived at if bronchoscopic examination is negative for bronchial tumor, and bronchial mucosa changes consistent with chronic suppuration is found in the presence of a clinical history consistent with bronchiectasis.

Analyzing Table IV, we find the greatest incidence in anatomic distribution (50%) is in the left lower lobe. This is the most dependent portion of the lungs, and the least efficient from the standpoint of adequacy of bronchial drainage. Next in frequency of

location is the right lower lobe (31%). The right middle lobe incidence of 12 per cent is substantial. Bilateral involvement, lower lobes, shows an incidence of 16 per cent. This points to a considerable degree of prevalence of the disease as being of a bilateral character. Not a single case was observed in which the disease was confined to the right or left upper lobes alone. One case was observed, however, occurring in a civilian, that presented extensive bilateral upper lobe involvement. This patient also had bronchiectatic lesions at both lower lobes. This case was observed for several years because of recurring fever, bloody sputum, apical rales, and radiographic shadows consistent with a bilateral apical tuberculosis. The patient succumbed to a septic bronchopneumonia, and the anatomical examination revealed extensive bilateral apical bronchiectasis. No trace of tuberculosis was found anywhere in the lung sections.

#### BRONCHIECTASIS IN THE ARMED FORCES

The diseases most commonly seen in the Respiratory Section of the Station Hospital are nasopharyngitis, bronchitis, atypical pneumonia, bacterial pneumonia and tonsillitis. Of particular interest, however, is a small but not inconsiderable number of cases of respiratory disease that reach the wards which have special significance. The latter are important because they point to a potential diagnosis of bronchiectasis. They present peculiar clinical features and for practical purposes can be divided into three categories: (1) Those that appear at the dispensary because of chronic cough and sputum. (2) Those that come to the admitting office for sick call because of blood spitting, often times not aware that they have had chronic pulmonary disease. (3) This group, easily confounded with an acute bacterial bronchopneumonia, consists of those cases of bronchiectasis that have experienced an endogenous extension from diseased into healthy bronchi. This results in a symptom complex consisting of fever, cough, expectoration and mild toxemia. A detailed study of this type of apparently acute lung infection will almost invariably reveal a history of chronic chest trouble. Physical examination in these cases almost invariably reveals rales at one or both bases, and the x-rays present shadows that are consistent with a bronchopneumonia. When convalescence is established, which occurs rather rapidly in most cases, a bronchographic examination will reveal varying degrees of bronchiectasis.

Returning to a discussion of the first two types of cases, namely those presenting cough and sputum, and those presenting hemoptysis as the chief complaint, in either instance these soldiers may be sent to the hospital dispensary for the purpose of admission to evaluate as to etiology. During their hospital stay they are studied

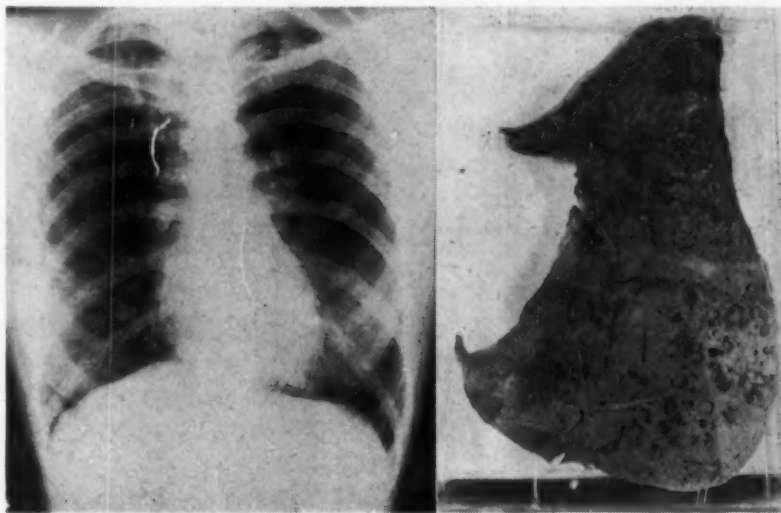
bacteriologically, radiographically, and by means of bronchography. When the diagnosis of bronchiectasis is confirmed they are separated from the Army on the basis of a Certificate of Disability.

It should be emphasized that the incidence of bronchiectasis in the Army does not exceed that found in the civilian population. It was present before induction, and for the obvious reason of clinical quiescence, cases of bronchiectasis can be missed readily at the time of induction. Moreover, because of the usually high level of nutritional and physical fitness that obtains in the majority of cases, acceptance for military service is not uncommon.

At this juncture it should be stated that a certain number of prospective recruits will deny when interviewed that they ever had any chest trouble. (Possibly these men are motivated by patriotism to do so.)

As regards the regulations pertaining to the acceptance of men with lung pathology for service, the mobilization regulations (*MR 1-9*) stipulate that bronchiectasis as well as chronic severe bronchitis are disqualifying. Hence, when a diagnosis of either condition is made, these soldiers are separated from the service after they have appeared before a board of medical officers designated as a

#### CIVILIAN GROUP



*Case Ia, Fig. 1*

*Case Ia, Fig. 2*

*Case Ia, Fig. 1*—12/6/32. The radiograph shows infiltration with fibrosis in both apices, more marked on the right, in the infraclavicular region. X-ray diagnosis: Bilateral apical tuberculosis, more marked on the right. *Case Ia, Fig. 2*—Specimen of section throughout entire left lung. Patient died of a septic bronchopneumonia. The upper lobe shows an extensive bronchopneumonia with numerous bronchiectatic cavities interspersed throughout. The right lung had similar pathology. Note the marked fibrous demarcation between the upper and lower lobes. Considerate bronchiectasis is also present in the left lower lobe.



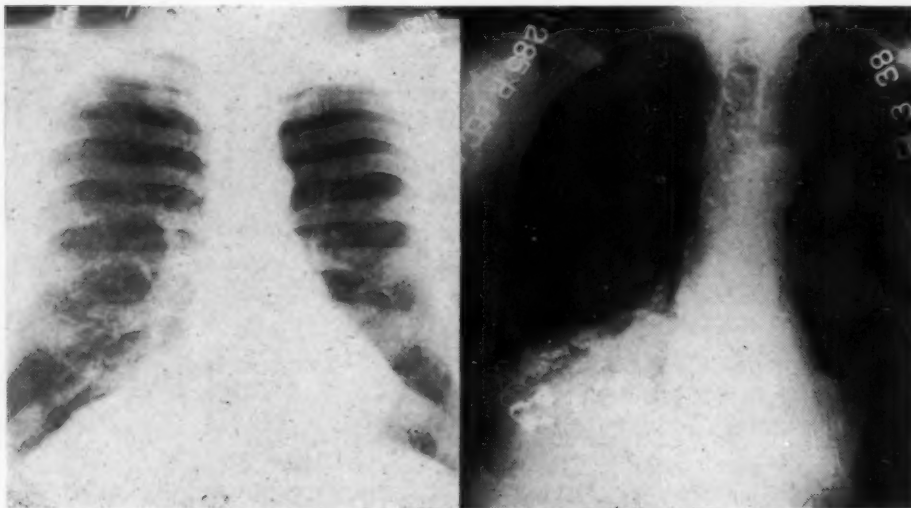
C.D.D. board, i.e., the board is authorized to recommend discharge on a Certificate of Disability.

In this connection it should be stated that upon discharge from the Army, if in need of hospital care, the soldier will be admitted to a Veterans' Hospital for treatment under existing War Department Circulars (W. D. Cir. 103, Section 5, April 15, 1943).

Up to the time of the present report, the diagnosis of bronchiectasis was made in thirty-two cases admitted to the Respiratory Section of a Station Hospital. The hospital began to function three years ago. Of this group seventeen were discharged from the Army and were transferred to Veterans' Hospital for further care. The remaining fifteen cases were separated from the service, but returned to their homes. Thus, it is possible to make a clinical study only of the latter group, because the records of the former are now the property of the Veterans Bureau.

Observations made in the group of cases whose records are available concern the study of factors in etiology, the clinical features, x-ray findings prior to bronchography, and the anatomical involvement. One case gave a history of pneumonia and empyema in childhood. Seven cases had pneumonia; of these three had it once, while four cases had it several times. Five gave a history of frequent chest colds and six gave a history of chronic cough. One case is of particular interest because bronchiectasis developed as a

#### CIVILIAN GROUP



*Case 11a, Fig. 1*

*Case 11a, Fig. 2*

*Case 11a, Fig. 1—2/26/37. X-ray interpretation: "There are numerous rounded areas of increased radiance ('honeycomb') visible in the lower portion of the right lung field." Case 11a, Fig. 2—1/27/38. Bronchogram: "Extensive saccular dilatation of the terminal bronchi in the right middle and lower lobes, with extensive pneumonitis."*



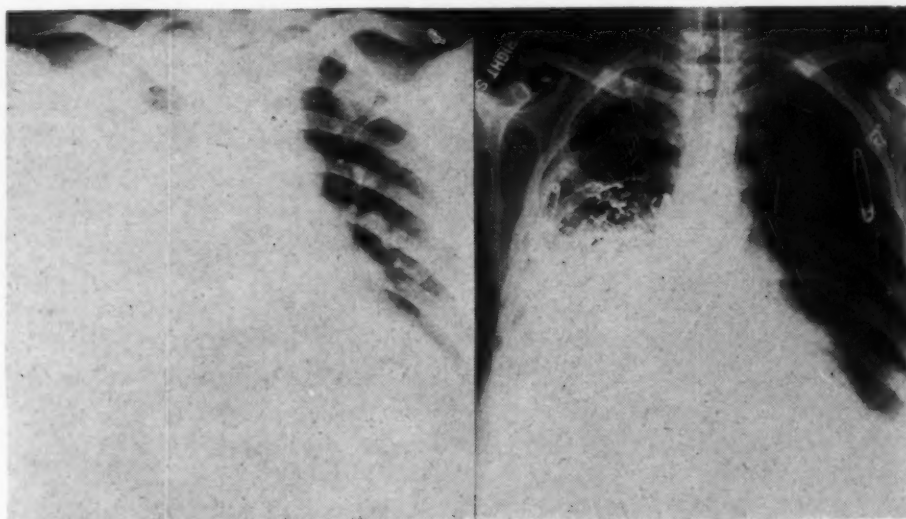
complication of an atypical pneumonia. This soldier's past history was negative for chest disease; the symptomatology and radiographic studies in the hospital were characteristic of atypical pneumonia; cough and expectoration of large amount of foul sputum appeared during the period of recovery from the initial phase of the illness. Bronchographic examination confirmed the clinical diagnosis of bronchiectasis, and he has since been transferred to a general hospital for definitive treatment.

The clinical features present at the time of admission were as follows: one had clubbing of the fingers; two cases had foul sputum. Hemoptysis was present in three. Seven cases had a bronchopneumonia on admission, clinically and roentgenographically. All except one had rales at one or both bases. As for concomitant diseases discussed in the civilian group, namely, bronchial asthma, sinusitis, and bronchial carcinoma, none of these was found in the military group.

The incidence of characteristic x-ray findings prior to the instillation of lipiodol was as follows: Seventeen out of a total of thirty-two had increased bronchial markings. Seven had honeycombs. Atelectasis was found in four cases. One case presented pneumonic infiltration.

As regards the anatomical distribution in the soldier group, the following findings were noted: Fourteen cases out of the total of

#### CIVILIAN GROUP



*Case IIIa, Fig. 1*

*Case IIIa, Fig. 2*

*Case IIIa, Fig. 1*—X-ray 2/26/36: "The entire lung field on the right, right border of the heart, and right diaphragm are obscured by a large amount of fluid."

*Case IIIa, Fig. 2*—6/24/36. Following lipiodol instillation through the drainage sinus there is revealed an extensive cylindrical type of bronchiectasis situated in the middle lobe. Note lipiodol in the trachea.

thirty-two had disease in the left lower lobe. Thirteen had it in the right lower lobe. The right middle lobe was involved in five cases. The disease was found in the lower lobe bilaterally in eight cases. No apical involvement was noted in any of the military group.

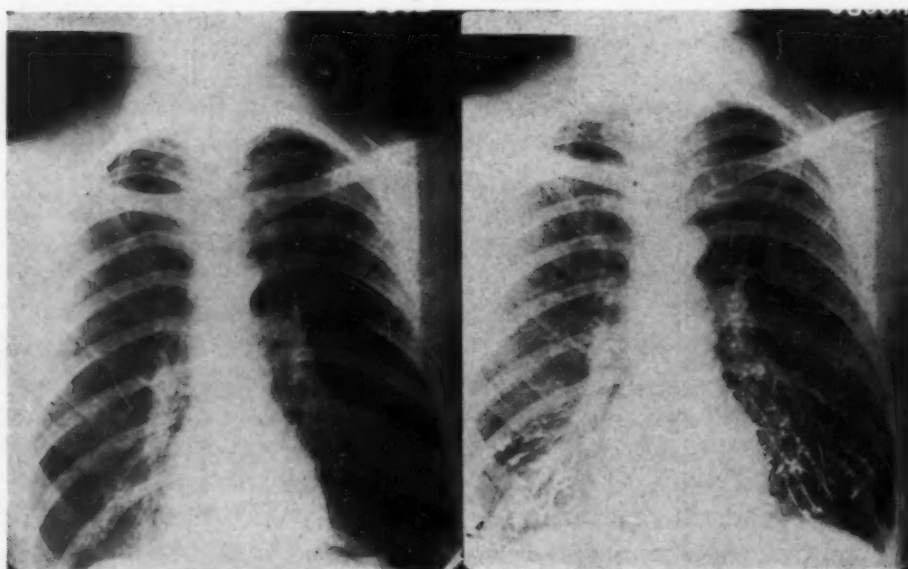
#### CASE REPORTS (CIVILIAN)

*Case Ia*—Age 22, female, with a history of several sanatorium admissions because of chronic cough, sputum, hemoptysis, and bilateral apical rales; was observed at the Thoracic Clinic for about a year. Findings during the latter period were bilateral apical rales, recurring hemoptysis, and cough and sputum. The clinical diagnosis was tuberculosis. This was checked by radiography which pointed to bilateral apical infiltration with fibrosis consistent with tuberculosis. The patient succumbed to a septic bronchopneumonia. Post mortem examination revealed extensive bronchiectasis involving both apices bilaterally. There was a good deal of bronchiectasis in the lower lung portions as well. No evidence of tuberculosis anywhere. This case illustrates the importance of differential diagnosis, and how bronchiectasis in the upper lobe can be mistaken for tuberculosis.

*Case IIa*—Age 55, male, came to the clinic with symptoms of cough and copious expectoration of many years' duration. No history of specific antecedent disease. Physical examination revealed numerous rales at right base; no foul sputum or clubbed fingers; excellent nutrition. The clinical diagnosis was bronchiectasis.

*Case IIIa*—Female, age 60. Admission diagnosis was acute empyema, right chest. Past history: pneumonia and empyema at 20 years of age

#### MILITARY GROUP



*Case Ib, Fig. 1*

*Case Ib, Fig. 2*

*Case Ib, Fig. 1*.—Plain film: "Marked prominence of the bronchial markings and 'honeycombs' bilaterally." *Case Ib, Fig. 2*.—Bronchogram: "Cylindrical bronchiectasis in left lower lobe, and saccular bronchiectasis in the right middle lobe."

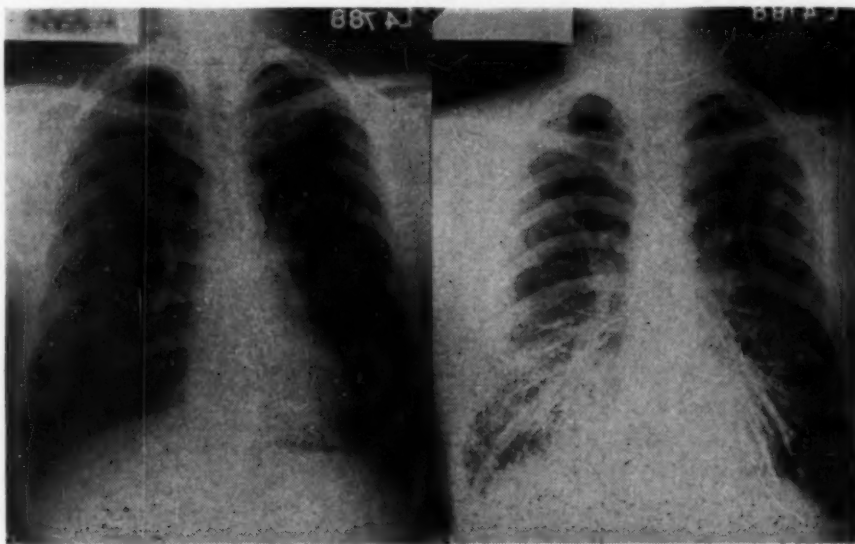
with uneventful recovery, except for a residual cough and scanty sputum which have persisted to date. Had been in good health and nutrition prior to present illness. Operation by rib resection. Convalescence was uneventful, and a bronchogram was obtained by the instillation of lipiodol through the drainage tube. This procedure revealed the passage of the lipiodol from the pleural cavity into the middle and lower lobes and into the trachea. A bronchopleural fistula had resulted from lung perforation in the presence of severe bronchopulmonary disease, causing acute empyema. It is of interest that the patient was well clinically prior to the development of this complication. This case is an example of one of the serious possibilities in the evolution of bronchiectasis.

#### CASE REPORTS (MILITARY)

*Case Ib*—Age 24, entered Army by enlistment in 1939. Entered hospital on January 28, 1942, with the following symptoms: cough and sputum of two years duration. Previous hospital admission at Fort Benning for the same complaints in 1941. Past history: pneumonia on three occasions in civilian life. Reason for present admission was to determine fitness for combat duty. Physical examination: well developed and well nourished; no fever; four ounces of mucopurulent sputum in twenty-four hours; rales at both bases; no foul sputum, hemoptysis, or finger clubbing. This soldier was found to have extensive bronchiectasis bilaterally. Condition excellent. He was separated from the service on a Certificate of Disability.

*Case Iib*—Pvt., age 34, inducted with ten months service, was admitted to the Station Hospital on January 12, 1942. Chief complaint: cough and sputum of several years' duration prior to induction. Past history: always

#### MILITARY GROUP



*Case Iib, Fig. 1*

*Case Iib, Fig. 2*

*Case Iib, Fig. 1*—"Plain films show prominent bronchial markings at the right base and emphysema at the left base." *Case Iib, Fig. 2*—Bronchogram: "Extensive bronchiectasis involving the left lower lobe." *Comment*: In this case we see how advanced disease in the left lower lobe produced a compensatory mechanism as evidenced by the production of considerable emphysema of the lobe affected.

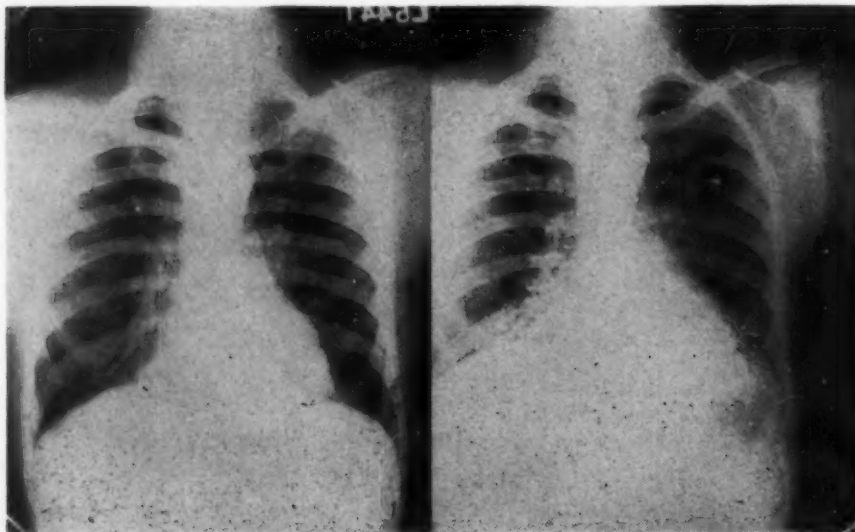
in good health, except that he had pneumonia at fifteen years of age, and again two years prior to induction. On latter occasion said to have had bronchopneumonia. Has also had very many chest colds that were accompanied by bloody sputum, for very many years. Physical examination: well developed and well nourished; sibilant and sonorous rhonchi at both bases.

*Case IIIb*—Pvt., age 24, inducted with seven months service, and no previous Army hospital admission, was admitted to the Station Hospital on August 14, 1941. Chief complaint: chronic cough and foul sputum during previous year. Past history: cough of many years duration and copious sputum accompanied by hemoptysis. Present illness: does not feel sick, but cough has increased of late, and sputum, which is foul, is also bloody. Physical examination: well developed and well nourished, non-toxic; no finger clubbing; chest shows rales at both bases.

#### CONCLUSIONS

- 1) Bronchiectasis is a very common disease.
- 2) It can be diagnosed in its earlier developmental phases, but is overlooked, chiefly because of the apparently innocuous manifestations during this period.
- 3) Respiratory disease occurring in childhood and young adult life should always be kept in mind as a possible forerunner of bronchiectasis.
- 4) Bronchiectasis is capable of producing serious complications, such as hemorrhage, empyema, and septic pneumonia.

#### MILITARY GROUP



*Case IIIb, Fig. 1*

*Case IIIb, Fig. 2*

*Case IIIb, Fig. 1*—"Plain films show prominent bronchial markings in right lower chest with 'honeycombs' in this area." *Case IIIb, Fig. 2*—Bronchogram: "Extensive bronchiectasis with bronchiectatic cavity involving the right lower lobe." *Comment:* This soldier was separated from the service on a Certificate of Disability. He showed severe bronchopulmonary suppuration.



5) The importance of bronchography cannot be overemphasized, and no suspected case should be dismissed from observation without it.

6) The military group studied does not differ in any respect from the civilian group which serves as a comparison.

7) It is the opinion of the authors that the aggregate number of cases of confirmed bronchiectasis found in the armed forces constitutes a fair proportion of the total number of inductees that are being separated from the army on the basis of a Certificate of Disability. Thus, out of a total of 1753 cases observed at the Station Hospital since September, 1940, and separated from the service for various causes, 32 cases were discharged because of bronchiectasis, an incidence of 2 per cent. Similar data have been published in the Army Medical Bulletin, October, 1943.

8) A group of cases of bronchiectasis consisting of civilian and military components is discussed. Clinical and roentgenological observations in the latter group are essentially the same as in the former. Episodes of respiratory disease prior to the development of bronchiectasis, clinical manifestations and roentgenological signs are essentially the same in both groups.

#### CONCLUSIONES

1) La bronquiectasia es una enfermedad muy común.

2) Puede hacerse el diagnóstico en las fases más tempranas de su desarrollo, pero se la pasa por alto, principalmente porque los síntomas durante este periodo son aparentemente inocuos.

3) Se debe tener presente que enfermedades del aparato respiratorio en la niñez y la juventud pueden ser posibles precursoras de la bronquiectasia.

4) La bronquiectasia puede producir complicaciones graves, tales como hemorragia, empiema y neumonía séptica.

5) Es imposible exagerar la importancia de la broncografía, y no debe discontinuarse la observación de ningún caso sospechoso sin haberla llevado a cabo.

6) El grupo militar estudiado no es, en ningún respecto, diferente del grupo civil con el que se comparó.

7) Opinan los autores que el número de casos de bronquiectasia comprobada que se descubrió en las fuerzas armadas constituye una proporción apreciable del número total de reclutas dados de baja del ejército con Certificados de Incapacidad. De un total de 1753 casos observados en el Hospital del Puesto Militar desde Septiembre de 1940, y separados del servicio por varias causas, 32 casos fueron dados de baja por bronquiectasia, o sea una proporción del 2 por ciento. Se ha publicado datos semejantes en el Boletín Médico del Ejército de Octubre de 1943.

8) Se discute un grupo de casos de bronquiectasia que consiste de elementos civiles y militares. Las observaciones clínicas y roentgenológicas del segundo grupo son, en lo esencial, idénticas a las del primer grupo. Los ataques de enfermedades respiratorias previas al desarrollo de la bronquiectasia, los síntomas clínicos y los signos roentgenológicos son, en lo esencial, idénticos en ambos grupos.

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## Boeck's Sarcoid\*

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I do not believe there is a great deal to be gained by a review of the history of Boeck's sarcoid. I merely wish to remind you that it is being reported with increasing frequency and so must be considered in any chest diagnosis.

I wish to very briefly summarize some of the salient features regarding Boeck's sarcoid and then review a case that has been under my observation for several years.

### ETIOLOGY

The various theories regarding the etiology only serve to demonstrate how much there is yet to be proved about this disease. Boeck<sup>1</sup> originally considered the disease to be a constitutional one, caused by a non-virulent form of tubercle bacillus. This opinion is still held by a large number of men. A comparatively high proportion of cases will later develop an active tuberculosis. Pinner believes that tuberculous lesions develop as a part of the sarcoid lesions and not as a separate disease concurrent with the sarcoidosis. Kyrle,<sup>2</sup> Wende,<sup>3</sup> and Goeckerman,<sup>4</sup> have demonstrated tubercle bacilli in early cases, and believe that if early lesions were examined more frequently the percentage in which tubercle bacilli are found would increase.

Others feel that it may be a nonspecific tissue response to various types of organisms, and perhaps to several organisms at the same time. In this connection, tubercle bacillus, leprosy bacillus, spirochaeta pallida, and Leishmania have been mentioned.

Pullinger,<sup>5</sup> Ross,<sup>6</sup> and others have advanced a hypothesis that it may be a disease of the reticulo-endothelial system, comparable to Hodgkin's disease.

Kissmeyer and Nielsen<sup>7</sup> believe that it is a chronic infectious granuloma. They advanced the theory that it may be due to a virus infection and that it is a specific pathologic entity.

### PATHOLOGY

Histologically, the lesions resemble miliary tubercles. They are composed of epithelioid cells arranged in the form of miliary

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tubercles. These collections of cells may attain large proportions. They are not as a rule outlined by an inflammatory area of lymphoid cells. There is frequently a giant cell of the Langhans' type present in the center. Histologically, they closely resemble the lesion that Sabin has been able to produce in guinea pigs by injection of the phosphatide fraction of the tubercle bacillus. Rubin and Pinner<sup>9</sup> report caseation in sarcoid lesions. In all the cases in which caseation was present, tubercle bacilli could be demonstrated in the lesion but not in the non-caseous lesion. The presence of a caseating lesion does not rule out the diagnosis of sarcoid.

#### BACTERIOLOGY

Pinner,<sup>8</sup> in 1938, summarized the positive bacteriological findings that have been reported in the literature. There were very few. They did not prove conclusively that sarcoid was due to any one specific organism. In 1944, Pinner<sup>9</sup> makes a statement that "failure to find tubercle bacillus in the majority of sarcoid lesions is not a convincing argument against their tuberculous etiology, and the presence of tubercle bacillus in some lesions is not a positive proof."

#### TUBERCULIN REACTION

In a great majority of cases there is a hyposensitivity to tuberculin or a complete anergy. In most cases after the development of clinical pulmonary tuberculosis, the tuberculin reaction becomes positive. Schaumann<sup>10</sup> in 1936 reported that a negative skin reaction would become positive after the healing of cutaneous lesions in sarcoid. The theory has been advanced that the lesion produced an anticutin that neutralizes the tuberculo-pyrine. Pinner,<sup>11</sup> in 1939, was unable to consistently demonstrate an anticutin that would account for the negative skin reaction.

#### CLINICAL FEATURES

This disease usually begins insidiously in early adult life, involving the skin, lymph nodes, bones, and lungs. It is extremely chronic. The clinical manifestations will depend on the structure that is involved.

*Cutaneous Lesions*—These usually consist of local areas of infiltration involving the skin of the cheeks, forehead, ears, arms, legs, fingers, toes, or back. They are usually of a dark red or brown color. The color is due to pigment deposit and not to increased vascularity. Pressure near the periphery of the lesion produces some blanching, but pressure in the center does not. Fusiform swellings of the fingers and toes are frequent, and there is usually an associated bone involvement.

*Lymphadenopathy*—In a large percentage of cases there is a



lymph gland involvement, which may be generalized or may be confined to one or two sets of glands. The involved glands are usually smooth, discrete and painless. Splenomegaly is frequent.

*Pulmonary Lesions*—Superficial, mediastinal, and peribronchial nodes are usually enlarged. Frequently the pulmonary involvement extends toward the bases, rather than towards the apices. Radiographically, the lungs show bilateral enlarged hilar glands. Atelectasis may be present as a result of compression by the hilar glands. There is usually interstitial fibrosis and multiple miliary foci resembling miliary tuberculosis.

*Skeletal System*—Small cysts are frequently found in the medullary portion of the bone. This involvement is most frequent in the bones of the fingers and toes. There is usually an area of decreased density in the bone with a surrounding area of increased density. These areas may be multiple and they may be very small.

*Eye Lesions*—In about ten per cent of the cases, involvement of the iris and ciliary body is present.

*Parotid Glands*—Enlargement of the parotid as the result of the presence of sarcoid has been reported. If iridocyclitis is present at the same time, a syndrome resembling uveoparotid fever is present.

*Other Involvements*—Lesions involving other organs as the kidney and spleen have been reported. In the kidney, the involvement is comparatively rare. In the spleen, it is quite frequently reported.

#### CASE HISTORY

I now wish to review a case that has been under my observation for several years.

This man was admitted to the sanatorium in December, 1942. At that time he was 33 years of age. He is white, has been married for ten years, and has two children that are living and well. His mother died of tuberculosis in 1916. Otherwise his family history is essentially negative. His past history is essentially negative.

This patient had a nocturia of several times a night for several years but did not consult a physician. There was no pyuria, dysuria, or hematuria. He was apparently in good health until the fall of 1941. There was a marked loss of weight that he could not account for at that time. During the winter he developed a dry hacking cough. In the spring he noticed that there was a definite loss of appetite. His cough, loss of weight and appetite persisted until the middle of the summer. A mild dyspnea developed. He lost 27 pounds. A tuberculin test at that time produced a negative reaction. He continued to work for approximately another month. At that time he had an attack of vomiting that was followed by nausea for several days. He had no previous gastro-intestinal symptoms that could have accounted for the vomiting. It did not seem to be associated with food and was not relieved by the usual alkali. He was advised to have his teeth examined and had one tooth extracted. Later there was another attack of vomiting and more teeth were extracted. The weight had dropped at this time from 217 pounds to 173. The sputum had gradually become productive of approximately an ounce of white,

somewhat thick sputum, in 24 hours. Dyspnea increased. In spite of the weight loss and lack of appetite, this patient continued to work. During an attack of coughing, he coughed up a plug of fibrin which was sent to a laboratory for examination. The report indicated a chronic lung disease and an x-ray was taken. This showed involvement in both lung fields. In spite of the negative tuberculin reaction, he was advised to have sanatorium treatment. About a month before his admission to the sanatorium, several small discrete movable non-tender glands appeared in the inguinal regions.

#### PHYSICAL EXAMINATION

*Chest*—Right: Essentially negative except for increased vocal fremitus anteriorly and posteriorly. There was some impairment of percussion note and no rales. Left: Essentially negative.

*Glandular System*—Negative except for freely movable discrete non-tender glands in both inguinal regions.

*Vascular System*—Rate, 100. Blood vessels, normal. Blood pressure, 188/134.

#### LABORATORY FINDINGS

*Sputum*—Approximately 25 cc. of serous sputum in 24 hours, negative for tubercle bacilli and fungus. Guinea pig inoculation negative for acid-fast organisms.

*Stomach Washings*—Negative for acid fast.

*Blood*—Sedimentation rate, 32 mm. in  $\frac{1}{2}$  hour; 76 mm. in 1 hour; N.P.N., 71.6; Hgb,  $13\frac{1}{2}$  grams; Rbc, 4,160,000; Wbc, 6,500; Poly, 60; Lymph, 25; Mono, 5; Eosin, 10.

*Urine*—A. M. Sample: Pus cells, 8-10; pus casts, 1-3; coarse gran. casts, 0-1; occasional fine gran. casts; rare hyaline casts; Mosenthal, 1005-1010; day, 999 cc.; night, 950 cc.; direct smear, negative for acid fast; culture, negative for acid fast.

*Mantoux*—0.01 mgm. (P.P.D.) negative. Patch test negative.

#### X-RAY FINDINGS

X-rays of the lungs showed large hilar glands on both sides with a productive type of infiltration in the first, second, and third interspaces anteriorly, on the right. There was a productive lesion in the first interspace anteriorly and in the third interspace on the left.

Repeated x-rays during this patient's stay in the sanatorium showed no essential change. X-rays of the hands were taken and one small cystic area of approximately 3 mm. in diameter was demonstrated.

*Inguinal Glands* were removed on both sides during patient's stay in the sanatorium. These were sent to different laboratories for examination. The report on all of these sections was consistent with a diagnosis of Boeck's sarcoid.

This man has been intensely interested in his case and in December, 1943, wrote me a rather detailed report of his condition since leaving the sanatorium. At that time he was working and apparently feeling quite well. Last April he had a rather severe cold, was in bed for eight days and lost 10 pounds in weight, but apparently recovered completely. There was still some dyspnea. X-rays of the lungs showed essentially no change. He still continues to have the kidney involvement. Urine showed approximately 1+ albumen. Blood pressure was 170/110. The inguinal glands are

still enlarged. A cervical gland became enlarged during the summer and this gland persisted. He has had several attacks of vomiting for no apparent reason, and in the interval between these attacks has had no trouble as far as the gastro-intestinal system is concerned.

After the first of the year (1944) he seemed to be in fair condition. Most of the joint aches and pains, as well as those of the left kidney region, disappeared. He was taking life fairly easy most of the time.

In March, 1944, he had a cold similar to the one in April, 1943, but not so severe. Chest felt congested. Much coughing and sputum. No fever or soreness of throat. General aches and pains, also kidney pains, returned and are still present. He has kept his appetite, however, and now is feeling quite well again. He has to be careful to prevent becoming tired. Inguinal glands have remained swollen and he is still bothered with coughing and shortness of breath.

He recently visited his doctor who found no change in the blood pressure.

He is now acting as an agent for an insurance company in his home county. He finds that he can do what he wants to do, just about when he wants to do it and keeps from becoming tired.

As I have stated, this man is still comparatively well. We have not had the advantage of having a pathological examination to find out definitely what type of involvement he has in the kidneys. It is my impression that this kidney condition very probably is sarcoid in nature, especially in view of the fact that he has had no previous history that would indicate any kidney involvement. I believe the attacks of vomiting have been on the basis of lack of kidney function, or it is possible that there could be a sarcoid involvement of the intestinal tract itself.

During his stay at the sanatorium, patient was treated symptomatically, and although there was some gain in weight, neither his x-rays nor his clinical condition changed appreciably. He was advised that the outlook was rather uncertain and that there was no treatment except for specific symptoms as they developed.

#### SUMMARY

A summary of the literature on Boeck's Sarcoid is presented.

No definite conclusions can be drawn regarding the etiology or bacteriology. The pathology closely resembles that of tuberculosis. Clinically this disease is manifested by involvement of almost any part of the body. The usual involvement is in the glands, lungs, skin and bones. This disease is not incompatible with longevity. A case of Boeck's Sarcoid is presented in which there is probably kidney involvement. This patient is alive and able to carry on moderate work two years after diagnosis, and three years following the original symptoms.

#### RESUMEN

Se presenta un resumen de la literatura sobre la sarcoidosis.

No se puede sacar conclusiones bien definidas acerca de la etio-

logía o la bacteriología. La patología es muy semejante a la de la tuberculosis. Desde el punto de vista clínico la enfermedad se manifiesta con la invasión de casi cualquiera parte del cuerpo. Comúnmente invade los ganglios, pulmones, piel y huesos. La enfermedad no es incompatible con la longevidad. Se presenta un caso de sarcoidosis en el que probablemente existe invasión del riñón. El paciente vive y trabaja moderadamente dos años después del diagnóstico y tres años después de la iniciación de los síntomas.

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## The Chest X-Ray\*

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Thousands and thousands of x-ray pictures of the chest pass before the eyes of induction station radiologists throughout the nation. The resultant satisfaction in discovering new cases of pulmonary pathology is certain to mean that the case finding method of the future is going to be that of mass x-ray. To add a little to our rapidly accumulating knowledge of this method and also to report on the expected occurrence of the unusual, a statistical study of 223,182 chest x-ray readings is presented here.

### MATERIAL

The material for this study consisted mostly of chest x-rays of Selective Service registrants between the ages of 18 and 35. Some were up to 45 years of age and some were soldiers already in the Army, being rayed prior to discharge or overseas duty. The great majority were from the South. Of these 47.1 per cent were colored. The usual procedure consisted of a 4x5-inch stereoscopic film being taken. If any suspicious pathology was seen by the radiologist in

### TABLE I—RESULTS

#### A SUMMARY OF THORACIC DEFECTS AS REVEALED BY X-RAY

##### *Breakdown of Films According to Classification of Men*

Selective Service registrants .....	212,904
Soldiers x-rayed prior to foreign service .....	3,984
Army recruits .....	2,318
Soldiers x-rayed prior to over-age discharge .....	1,943
Volunteer officer candidates .....	1,063
Enlisted reserve corps men returned to duty .....	555
Miscellaneous films made of soldiers .....	415
<hr/>	
Total number of x-ray films in summary .....	223,182

##### *Breakdown of Films According to Race of Men X-rayed*

White .....	118,024
Colored .....	105,158

\*The writer wishes to thank Lieut. Col. James H. Fox, Chief Medical Examiner, and his staff for their assistance in the preparation of this paper. Special appreciation is acknowledged to Majors N. C. House and J. H. King; and to Captains W. H. Angerman, M. B. Brown, and J. W. Straughn, who conducted the clinical examination of the chest; also to the Naval Medical Officers Lieuts. J. R. Pearson and R. W. Merrill.

these small films, a 14x17-inch negative was obtained before a final decision was made. The 14x17-inch films were reviewed by a conference consisting of the radiologist, two or more internists and recently a naval medical officer. Impressions were based chiefly on the interpretation of the x-ray films. However, whenever necessary, the individual was rechecked by the internist and the clinical history and findings were taken into consideration. The urgency of rapidly accumulating an Army and Navy did not always permit extensive and lengthy laboratory and other diagnostic procedures to be performed on the obviously rejected selectee.

## PERMANENT REJECTIONS

Reason for Rejection	White		Colored		Total	
	No.	Pct.	No.	Pct.	No.	Pct.
Active tuberculosis .....	317	.2686	416	.3956	733	.3284
Healed tuberculosis, more than minimal .....	183	.1550	111	.1055	294	.1317
Pleurisy, severe .....	57	.0482	164	.1560	221	.0990
Pneumonitis, severe .....	76	.0644	83	.0789	159	.0712
Spinal deformity .....	23	.0195	33	.0314	56	.0251
Passive congestion with enlarged heart .....	10	.0085	10	.0095	20	.0089
Marked cardiac hypertrophy .....	32	.0271	63	.0599	95	.0425
Bronchiectasis, proven .....	4	.0034	0	.0000	4	.0018
Pulmonary tumor .....	8	.0068	11	.0105	19	.0085
Post-lobectomy, with extensive fibrosis .....	2	.0017	0	.0000	2	.0009
Pneumothorax, simplex .....	17	.0144	11	.0105	28	.0125
Aneurysm or aortitis .....	6	.0050	45	.0427	51	.0229
Unclassified pulmonary pathology .....	11	.0093	4	.0038	15	.0067
Gunshot wounds of chest .....	4	.0034	5	.0048	9	.0040
Tumor of diaphragm .....	0	.0000	3	.0029	3	.0013
Tumor of mediastinum .....	2	.0017	2	.0019	4	.0018
Acquired dextrocardia, severe .....	2	.0017	0	.0000	2	.0009
Atelectasis .....	2	.0017	1	.0010	3	.0013
Severe deformity of chest wall .....	2	.0017	2	.0019	4	.0018
Lung abscess .....	2	.0017	2	.0019	4	.0018
Pulmonary fibrosis .....	11	.0093	16	.0152	27	.0121
Post-thoracoplasty .....	3	.0025	0	.0000	3	.0013
Cardiac distortion .....	1	.0008	2	.0019	3	.0013
Coarctation of aorta .....	1	.0008	0	.0000	1	.0004
Patent ductus arteriosus .....	0	.0000	1	.0010	1	.0004
Cystic disease of lungs .....	1	.0008	5	.0048	6	.0027
Emphysema, severe .....	5	.0042	5	.0048	10	.0045

## PERMANENT REJECTIONS (Continued)

Reason for Rejection	White		Colored		Total	
	No.	Pct.	No.	Pct.	No.	Pct.
Subdiaphragmatic abscess or tumor .....	1	.0008	1	.0010	2	.0009
Paralysis of diaphragm .....	1	.0008	1	.0010	2	.0009
Pleural tumor .....	0	.0000	1	.0010	1	.0004
Scapula deformity, severe .....	0	.0000	3	.0029	3	.0013
Diaphragmatic hernia, verified .....	4	.0034	2	.0019	6	.0027
Knife wound of chest .....	0	.0000	1	.0010	1	.0004
Boeck's sarcoid .....	1	.0008	0	.0000	1	.0004
Tumor of rib .....	2	.0017	4	.0038	6	.0027
Hydro-pneumothorax .....	0	.0000	1	.0010	1	.0004
Post-traumatic deformity .....	1	.0008	0	.0000	1	.0004
Total rejections .....	791	.6701	1010	.9604	1801	.7970

## TEMPORARY REJECTIONS

Reason for Rejection	White		Colored		Total	
	No.	Pct.	No.	Pct.	No.	Pct.
Borderline tuberculosis .....	142	.1203	129	.1227	271	.1214
Pneumonitis, mild to moderate .....	95	.0804	84	.0798	179	.0802
Pleurisy, moderate .....	10	.0085	11	.0105	21	.0094
Increased markings, moderate to severe .....	8	.0067	2	.0019	10	.0045
Childhood tuberculosis, active .....	0	.0000	6	.0057	6	.0026
Post-lobectomy .....	1	.0008	0	.0000	1	.0004
Rib fracture .....	1	.0008	0	.0000	1	.0004
Pulmonary cyst .....	1	.0008	0	.0000	1	.0004
Hilar gland enlargement .....	3	.0025	2	.0019	5	.0022
Total rejections .....	261	.2211	234	.2225	495	.2218

SUMMARY OF CONGENITAL RIB ABNORMALITIES NOTED,  
NOT DISQUALIFYING

Cervical ribs (Note: One of these a cervical rib attached to the third cervical spine) .....	200	252	452
Rudimentary first ribs (Note: One of these a rudimentary third rib) .....	117	54	171
Bifid ribs .....	257	328	585
Joined ribs .....	118	63	181
Broadened ribs .....	93	58	151
Miscellaneous congenital rib abnormalities .....	30	22	52
	815	777	1592
	.6905	.7500	.7133

## SUMMARY OF READINGS NOTED, NOT DISQUALIFYING

Readings Noted	White	Colored	Total
Healed minimal tuberculosis.....	209	121	330
Healed childhood tuberculosis, pronounced.....	103	55	158
Pleurisy, mild.....	345	375	720
Increased hilar markings.....	151	127	278
Enlarged heart, mild.....	52	115	167
Shotgun pellets in chest.....	56	184	240
Spinal deformities, moderate.....	99	117	216
Rib fractures, with callus.....	25	15	40
Rib resection, old, well healed.....	47	12	59
Azygos lobe, pronounced.....	9	6	15
Deformity of clavicle.....	10	3	13
Dextrocardia (situs inversus).....	18	15	33*

*Note:* One additional dextrocardia disqualified for active tuberculosis. One additional dextrocardia disqualified for bronchiectasis. One additional dextrocardia disqualified for enlarged heart.

\*Includes one case true dextrocardia without situs inversus.

Dextrocardia, acquired.....	3	0	3
Absence of pectoralis major muscle.....	0	3	3
Emphysema, moderate.....	1	2	3
Deformity of scapula, congenital.....	1	0	1
Hypertrophied nipples.....	0	1	1
Excentric position of great vessels, marked.....	2	1	3
Calcium deposits in aorta, marked.....	0	1	1
Foreign bodies in chest wall.....	2	5	7

## COMMENT

In comment, a few of the interesting observations are noted. *Tuberculosis:* The incidence of disabling chest diseases, both of a permanent and temporary nature was 1.018 per cent, while the incidence of active tuberculosis was 0.3284 per cent. Known cases of active pulmonary tuberculosis are placed in IV-F by the local draft boards and are not sent to the induction station for examination. Most of the cases discovered by the x-ray in this series had very few or no symptoms, and many were early and treatable. The prognosis, as illustrated in the following chart, as a whole, was fairly good.\*

\*This method of denoting x-ray findings—each lung considered—was suggested by Dr. David Salkin, Hopemont Sanitarium, Hopemont, West Virginia, 1936.



## PROGNOSIS OF 1004 CASES

	No.	Pct.
Minimal	505	50.3
Moderately advanced	227	22.6
Far advanced	272	27.1

Borderline	271 cases		
Min/O	234 cases		
Min/Min	77 cases		
Ma/O	134 cases		
Fa/O	71 cases	Good prognosis	77.4%
Ma/Min	16 cases		
Fa/Min	22 cases	Fair prognosis	3.8%
Ma/Ma	41 cases		
Fa/Ma	37 cases		
Fa/Fa	101 cases	Poor prognosis	17.9%

This chart shows the amount of active disease in each lung. Unilateral cases and those bilateral of not more than minimal involvement in each lung (Min/Min) are considered "good prognosis." "Mostly unilateral" cases (Ma/Min, Fa/Min) are considered "fair prognosis." The remainder (17.82%) have a "poor prognosis."

The headquarters of the Mississippi State Selective Service requests the local boards to send all chest rejects from Mississippi to the State Sanatorium where Dr. Henry Boswell and staff serve as the Medical Advisory Board on chest diseases. Several hundred tuber-

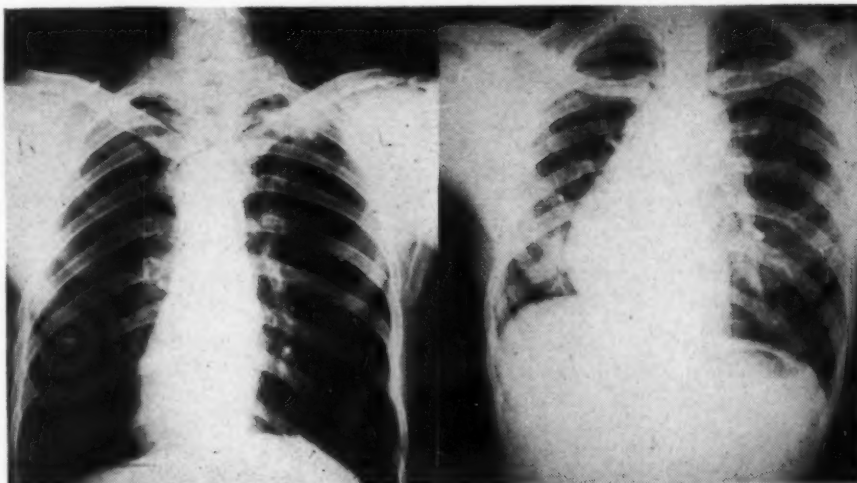


Fig. 1

Fig. 2

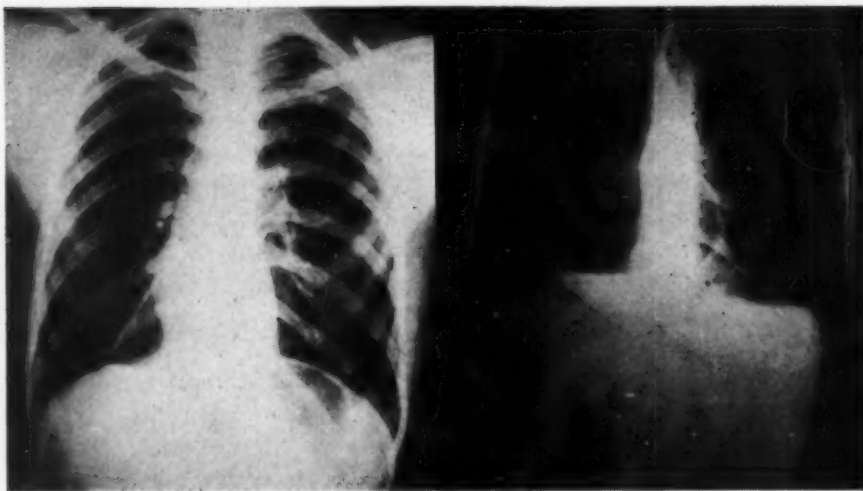
Fig. 1—Dextrocardia, situs inversus and apical tuberculosis. Fig. 2—Dextrocardia (acquired). Heart shift due to bulging of anterior right chest.

culosis rejects have become patients and have been given treatment at the sanatorium. Others whose disabilities are temporary or indefinite have been sent back to induction station for reconsideration. Numerous other chest rejects have been returned to their homes for treatment and observation. Complete follow-up is made on all contacts of those with active tuberculosis by the county health officers.

Our statistics include a group of soldiers who were x-rayed prior to being discharged for dependency or over-age. Eight out of every



*Fig. 3—Knife blade in lung. History of stab wound of chest five years ago. Was not aware that blade was in chest.*

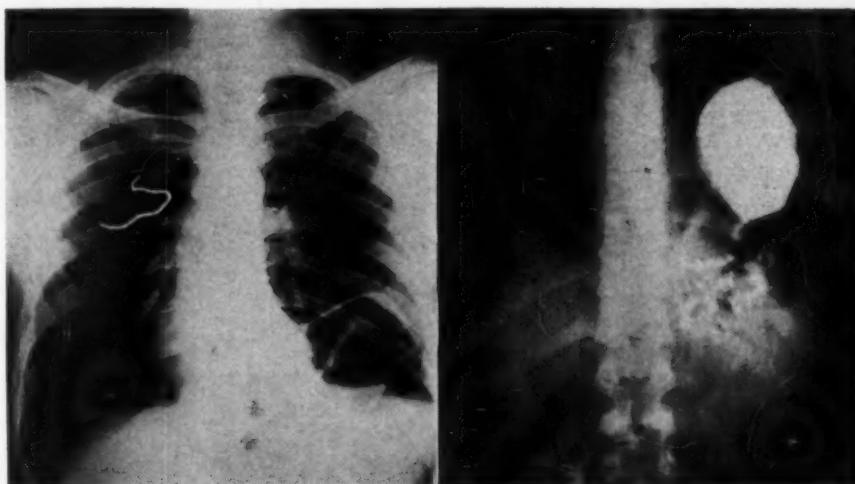


*Fig. 4a*

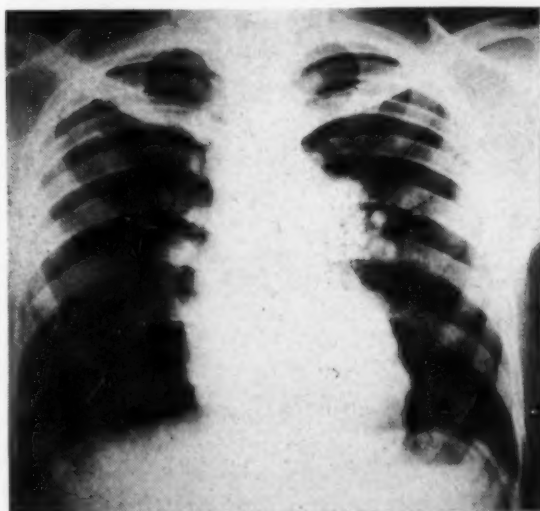
*Fig. 4b*

*Figs. 4a and 4b—Hiatus hernia of stomach.*

thousand (0.8%) were found to have a disabling chest disease. All of these found to be unfit for military service because of x-ray findings either had no symptoms or their symptoms were not sufficiently alarming to cause an investigation by their regimental medical officers. Routine x-rays of chest were not being made when these soldiers entered the army (National Guard and early pre-war Selective Service). Many of these defects would certainly have been discovered at time of induction had x-rays been made.

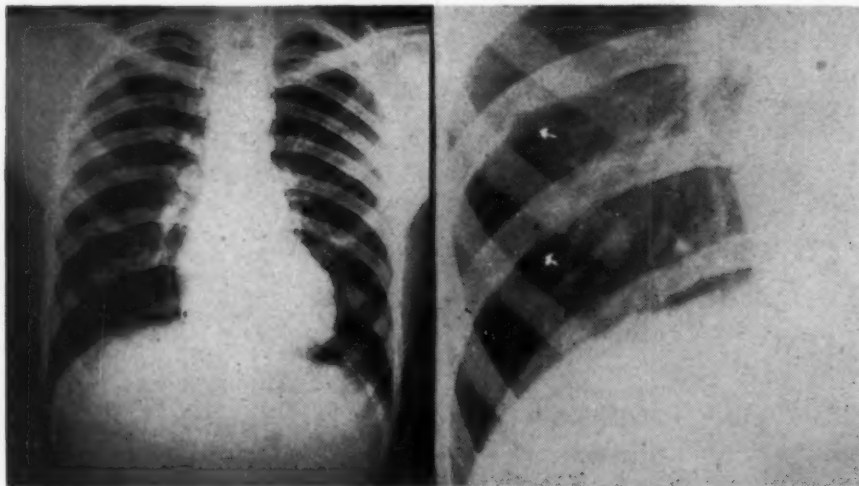
*Fig. 5a**Fig. 5b*

*Figs. 5a and 5b—Left diaphragmatic hernia.*

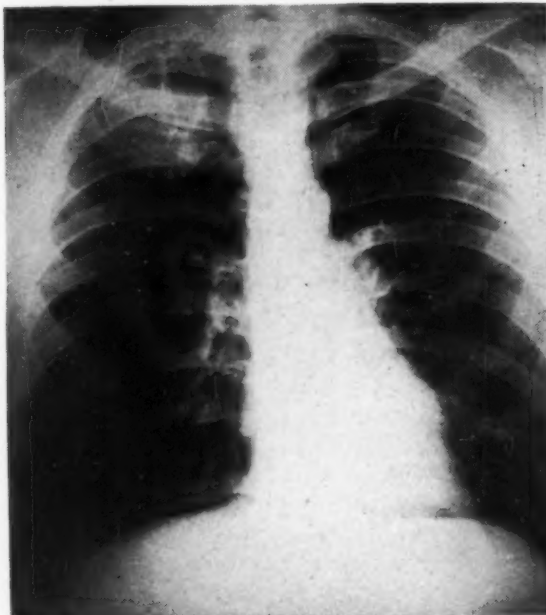


*Fig. 6—Congenital heart disease (patent ductus). High pitched systolic murmur and thrill in the second left intercostal space.*

In a group of registrants who completed their physical examination and were sent home before the x-ray was read, it was found that only 12.7 per cent of all those with rejectable chest diseases showed significant physical signs. This suggests that only approximately thirteen out of every one hundred chest pathologies would be discovered on a physical examination alone. What is more sig-

*Fig. 7a**Fig. 7b*

*Figs. 7a and 7b—Coarctation of the aorta. Loud aortic murmur. Blood pressure in upper extremity: 170/90, lower: 100/80.*



*Fig. 8—Tumor of first rib on right. Asymptomatic.*



nificant, only fourteen out of every one hundred cases of *active tuberculosis* as demonstrated by the roentgenogram could have been suspected from physical examination alone.

*Healed Tuberculosis*—No account was made of the incidence of minor calcium deposits in the entire series, but a check was made of 5000 plates chosen at random with this in mind. Thirty-eight per cent showed enough evidence to make the roentgenological diagnosis of healed primary tuberculosis. Only the more pronounced films suggestive of "healed childhood tuberculosis" were carried on the statistics under this category.

The impression of "healed tuberculosis, more than minimal; disqualifying" and "healed minimal tuberculosis; acceptable," depend chiefly on the number and size of calcium deposits or stable areas of fibrosis. However, the judgment of the internist and radiologist, taking into consideration the age and symptomatology, determines whether those cases of "military tuberculosis" are accepted or rejected. It is felt that most of these represent healed primary complexes.

*Dextrocardia*—There were 36 cases of true dextrocardia, an incidence of 0.016 per cent or 1 case out of every 6200 persons. A barium meal was given to all and a single flat plate of the abdomen taken. All but one had a situs inversus.

Four of these dextrocardias had accompanying disqualifying chest defects. The remainder were acceptable as far as the chest was concerned. One was disqualified for cardiac hypertrophy and passive congestion. One had minimal apical tuberculosis. Another had basal infiltration with a history suggestive of congenital bronchiectasis. The fourth had a slight cardiac enlargement and clinically gave signs of aortic stenosis.

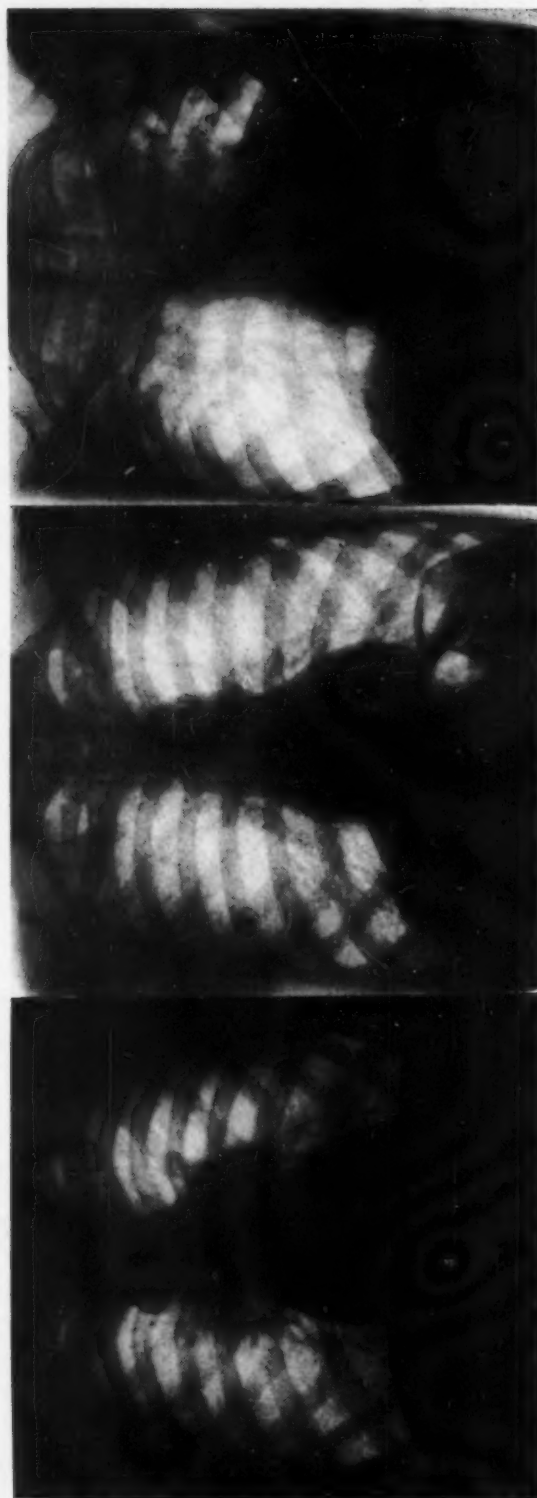
About one third of these individuals had no previous knowledge of the abnormal location of their hearts.

Some cases were justifiably missed by the internist on his examination and at least three cases could not be definitely diagnosed by clinical findings unless the examiner used a great deal of imagination plus a strong suspicion of mal-position.

Minor shifts of the heart were noted frequently. The most common cause for heart shifting was slight deformity of the chest wall or spine, which often was not apparent on viewing the flat plate of the chest. Major shifts to the right (acquired dextrocardia) occurred five times. One was caused by atrophy of right side of chest following an attack of infantile paralysis. Two were caused by bulges in the chest wall. The others were caused by thickened pleura and atelectasis.

*Congenital Rib Anomalies*—The percent incidence of rib abnormalities is 0.7133 per cent. This means 1 out of every 140 have a

Figure 9—TUBERCULOSIS



A

B

C

A. *Active Childhood*—History of recent continuous contact with active tuberculosis. B. *Active Military*—Loss of weight, fever and cough. C. *Active Adult*—He didn't know that he had tuberculosis.

congenital rib defect. There were 452 cases of cervical ribs. None of these were found to have any symptoms that people with cervical ribs are supposed to have. The incidence of rib defects in those with disqualifying lung diseases was 0.7156 as compared with 0.7133 per cent of the total. This does not support the theory that rib abnormalities predispose to lung disease. Spine pictures were not taken routinely on these cases but some of the rib deformities were associated with congenital spine defects.

A rudimentary third rib, an apparent absence of a second rib, and a case of a cervical rib of the 3rd cervical spine are among the unusual findings.

*Simulated Pulmonary Pathology*—The following conditions were noted that could be mistaken for disease of the lung, especially if the x-ray alone was considered: Cervical ribs; spurs on ribs; rib tumors; rib cysts; holes in ribs resulting from an old rib resection; rib calluses; calcified deposits in pleura; foreign body in chest; pieces of wearing apparel (buttons, suspender buckles, etc.); hypertrophied nipples; unilateral hypertrophy of breasts; absence of pectoralis muscle (unilateral); fibroma on skin of chest; azygos lobe; eccentric positions of great vessels; inequalities in chest musculature due to atrophy of muscle groups; island ossification of rib cartilage; floating ribs with apparently no visible sternal attachments; diaphragmatic hernia; neck muscle shadows.

*Unusual Observations*—It was noted that many cases of apical infiltration, diagnosed radiologically as active tuberculosis, returned to the station in three to six months with complete clearing. Some of these were merely patches of apical pneumonia while others probably represented spontaneous healing of minimal tuberculosis.

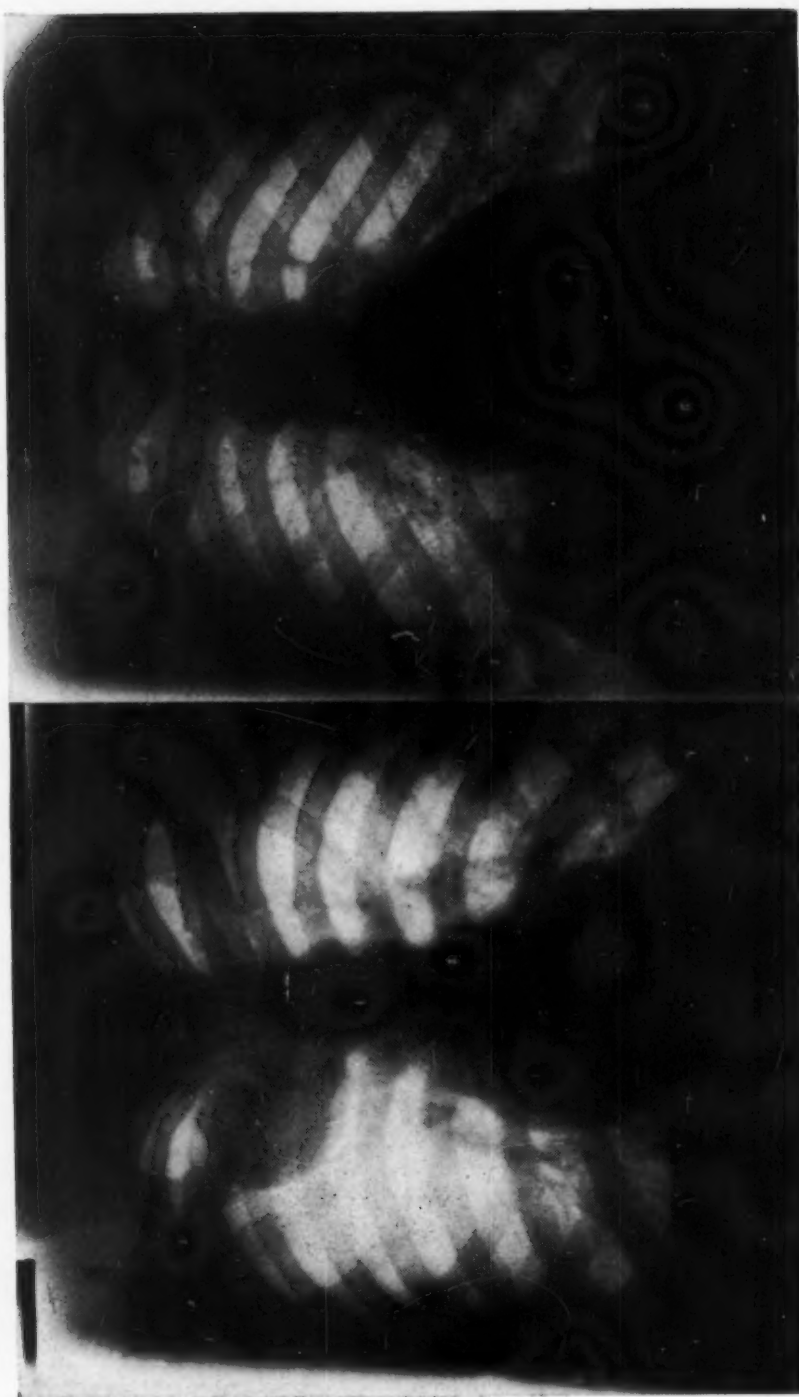
Calcification of the pleura seemed to be rather frequent. In 159 cases of disqualifying severe pleurisy, 31 had calcium deposits in the pleura.

Six cases of diaphragmatic hernia were found—all proven by barium meal. Five were on the usual left side. One was right sided and was discovered by the follow-up study at the State Sanatorium.

Pneumothorax simplex (pneumothorax with no apparent cause) occurred 28 times. Most of these had no symptoms whatever. One case was bilateral.

Considerable elevation of the diaphragm occurred many times, appearing with no apparent cause and with no symptoms. Spontaneous paralysis of the diaphragm was diagnosed twice. One of these had many deep cervical glands as the probable cause. The nature of these glands was not discovered. Fluoroscopy in the other case showed the considerably elevated diaphragm to move only a little although the movement was not paradoxical. The

Figure 10—TUMOR



A—Pulmonary.

B—Diaphragmatic.



history of birth injury with marked atrophy of the right upper extremity suggested cause for phrenic nerve damage.

Five cases had knife blade wounds of the chest with a portion of the blade still present. One was disqualified since the lateral view placed the blade in the lung itself. Four of the registrants were not aware that the blade was still in their chests. Only one had symptoms and that one complained of occasional vague pains in the left upper chest.

Shotgun pellets in the chest wall were numerous, occurring 240 times. Here again symptoms were few and far between, even in those few cases where the pellets appeared to be actually in the lung tissue.

A sewing needle was seen in the chest of one registrant who had no knowledge of how it got there. A triangular opacity was seen in the back of another man's chest. The only clue as to its identity was history of an auto accident five years before when registrant had been cut severely with flying glass. The opacity is probably due to the fact that some auto glass contains radiopaque metals.

#### SUMMARY

223,182 chest x-rays are reviewed. The incidence of disqualifying chest disease is about 1.0 per cent. The incidence of active tuberculosis is about 0.3 per cent, the majority of which are early and treatable, thus demonstrating once again that mass x-raying is a practical and excellent method of case-finding. It is very probable that universal x-ray surveys will be the method of choice employed by health departments and tuberculosis agencies in the future.

#### RESUMEN

Se repasa 223,182 radiografías torácicas, la mayor parte de las cuales son de individuos registrados en el Servicio Selectivo y el resto de soldados ya en el Ejército. La proporción de rechazos por enfermedad del pecho es del 1.0 por ciento, más o menos. La proporción de tuberculosis activa es de un 0.3 por ciento, la mayor parte de la cual es tuberculosis temprana y tratable, lo que demuestra una vez más que el tomar radiografías colectivas es un método práctico y excelente de descubrir casos. Es muy probable que los censos universales con los rayos X serán, en el futuro, el método de elección que emplearán los Departamentos de Sanidad y las instituciones tuberculosas.

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Opinions contained in this article are those of the writer.

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## The Problem of Tuberculosis in the Average Community\*

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*Cincinnati, Ohio*

Tuberculosis is one of the most widespread of the common infectious diseases. It accounts for from 5 to 10 per cent of all the deaths in the United States. In 1939, 61,609 persons died from tuberculosis, and, according to conservative figures, there are approximately 500,000 persons sick from tuberculosis in the United States at the present time. We know that there are approximately 95,000 hospital beds available for tuberculous patients; so that only one-fifth or one-sixth of the tuberculous patients have the advantage of hospitalization at any given time. The investment in the tuberculosis hospitals and institutions amounts to the enormous sum of \$300,000,000, and the cost of hospitalizing the tuberculous patient in 1940 was over \$80,000,000.

According to the National Tuberculosis Association, the economic loss to the family and community, plus the cost of care and treatment, amounts to \$10,000 for each death from tuberculosis. The number of deaths from tuberculosis in your community multiplied by this figure will give the economic loss from tuberculosis during any year.

From this introduction you can readily see that this treacherous disease, tuberculosis, affects every man, woman and child in your community, from a medical, public health, or economic standpoint. Too many people think of tuberculosis as solely the problem of the tuberculosis hospital, but this is far from being true. Far too few people realize that while there has been no family history of tuberculosis, and although they live in a section that is relatively free from tuberculosis, individuals may come in contact with tuberculosis much more frequently than one would suppose. Probably one-half of the patients entering tuberculosis hospitals today give no family history or any definite known contact.

One may estimate the number of tuberculous patients in his community by multiplying the annual number of deaths from tubercu-

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\*\*Superintendent and Associate Medical Director, Hamilton County Tuberculosis Hospital (a sub-department of the Department of Medicine, College of Medicine, University of Cincinnati), John Skavlem, M.D., Medical Director, Cincinnati, Ohio.

losis by eight. To be sure, some of these individuals would not be aware of the fact that they have tuberculosis, due to lack of symptoms. These individuals could only be found in a survey which would include tuberculin testing and x-ray examinations of the chest. Some of these patients would be under the care of their private physicians. Others have not been diagnosed as tuberculous, because they have not presented themselves for a complete physical examination, thinking that their cough might be a "cigarette cough" or just due to a chronic bronchitis.

On July 1, 1938, as tuberculosis coordinator for Cincinnati and Hamilton County, I undertook the study of the problems of tuberculosis in that community. Shortly thereafter, three outstanding facts were made quite obvious:

First: That the problem of tuberculosis is not fully appreciated by either the medical profession or by the general public.

Second: That there was a serious lack of effective cooperation and coordination of all agencies dealing with the tuberculosis problem.

Third: That in order to bring this great public health problem under control, we would have to spend more money in order to save money five, ten, fifteen, and twenty years later.

I will venture to say that these same conditions exist today in every community where tuberculosis is not definitely under control.

During the 2½ years spent as tuberculosis coordinator, I studied the problems of tuberculosis by visiting practically every patient in his home before admission to the tuberculosis hospital, by working in close cooperation with the City and County Boards of Health, the Welfare Department, Chest and Pneumothorax Clinics, various other agencies, and the Tuberculosis Hospital.

It was indeed a startling fact to find approximately only one-third of all these patients awaiting admission to the tuberculosis hospital at bed rest, while approximately two-thirds of these patients were up and around, going out as they pleased and probably infecting other people. This same condition exists in the average community today and offers a serious obstacle in the control of tuberculosis.

Frank Howard Richardson, in a recent treatise on tuberculosis, stated: "Every open-active case of tuberculosis infects from 60 to 100 per cent of the members of the household in which he lives." Infants and children up to two years of age so exposed often die of miliary tuberculosis or tuberculous meningitis. This point cannot be overemphasized, and every effort should be made to break the contact in the home where children are present as soon as possible, as the greatest danger comes within the first few months of exposure.

Of all patients admitted to tuberculosis sanatoria or hospitals in the United States at the present time, approximately 13 per cent are in the minimal stage; 32 per cent, in the moderately advanced stage,

and 55 per cent in the far-advanced stage. From this you see that 87 per cent of the patients are in the advanced stages.

A case of minimal tuberculosis would require six months or less hospitalization with practically 100 per cent cure, whereas moderately or far advanced cases require from two to six times that length of hospitalization. Cures in the latter groups are doubtful, and when they occur, the patients may be under a physical handicap the rest of their lives.

To further show the value and importance of early diagnosis, one needs only to study Hilleboe's article in *The American Review of Tuberculosis*, December, 1936, on "The Mortality of Discharged Tuberculous Patients from 1885 to 1935," to know what it means. From this study it was concluded that a person with minimal tuberculosis has a risk of dying increased approximately 4 times; one with moderately advanced, 16 times; one with far-advanced, 40 times over that of the person in the general population from which the patients were drawn.

Many communities like Cincinnati, and, no doubt, like Chattanooga, are greatly concerned about the number of people killed by automobiles, and there is hardly a day that the papers do not carry articles about this deplorable condition, but I will venture to say that few of these communities realize that approximately 4 times as many people die of tuberculosis every year as are killed by automobiles. Another rather startling fact has been called to the attention of the public in Cincinnati, and that is this: Approximately 675 persons died of tuberculosis during the past two years, while less than 35 persons died of such contagious diseases as cerebro-spinal meningitis, measles, typhoid fever, smallpox, scarlet fever, and diphtheria. This same ratio of deaths from tuberculosis and the contagious diseases mentioned above exists in many of the average communities today, without being realized or fully appreciated.

At this point it might be well to discuss the "Obstacles in the Control of Tuberculosis" as it applies in the average community. According to Dr. H. I. Spector of St. Louis, Missouri, in *The Bulletin of the National Tuberculosis Association*, February, 1939, the following may be cited:

First: The most important handicap in the eradication of tuberculosis is a shortage of hospital beds. Any attempt to control the dissemination of tuberculosis will prove ineffective as long as the unhospitalized patient continues to spread the disease. A ratio of two beds per annual death is only a safe minimum for any community.

Second: The second obstacle is late diagnosis. Limited budgets have held up continuous case-finding activities.



Third: The third obstacle is the low financial status of the patient in numberless instances, and his unwillingness to stop work.

Fourth: The inability to recognize the disease in the early stage on the part of the general practitioner seriously retards tuberculosis eradication.

Fifth: The high incidence of the disease among workers exposed to dust with a high silica content.

Sixth: A very important deficiency in our present control consists of our failure to rehabilitate the arrested case economically.

Nothing can be added to this as it applies to the average community except to say that the whole problem may be summarized in one brief sentence—*a lack of sufficient money to do a good job.*

Knowing this to be true, what can be done to improve conditions? The four major activities in any campaign against tuberculosis are Education, Diagnosis, Treatment, and Rehabilitation, each of which will be discussed separately.

#### EDUCATION

1) The public must be constantly and increasingly educated as to the danger and contagiousness of tuberculosis, so that the average person will seek medical attention at the onset of the symptoms and not wait until the disease has reached the moderately or far-advanced stages.

2) Public Officials need to be educated to the fact that quicker and better relief is essential to families where the bread-winner is the unfortunate victim of tuberculosis. Patients cannot successfully take the "cure" if they are worried about their families not getting enough to eat.

3) The public and the private physician need to be educated as to the available facilities as offered by local hospital clinics, the Board of Health and the local Tuberculosis and Health Associations where the indigent patient may have sputum examinations and x-rays at little or no cost, to assist the physician in making early and accurate diagnoses of tuberculosis.

4) The physicians should be educated to the necessity of reporting all cases of tuberculosis to the Board of Health as soon as the diagnosis is established. From this and other information, each community will have on record a true picture of its local tuberculosis problem.

#### DIAGNOSIS AND TREATMENT

Both of these are pretty well established. However, we should all strive for earlier diagnoses and immediate hospitalization when possible, unless the patient can be adequately taken care of at home by a physician who thoroughly understands tuberculosis. Early

diagnoses would save a great deal of time, money and lives. Dr. Henry Vaughan of Detroit, Michigan, has estimated that the finding of a case of tuberculosis in the minimal stage of the disease is a saving to the community of a thousand dollars.

#### REHABILITATION

This, along with education, has been sadly neglected. Dr. C. J. McIntyr in *The Bulletin of the National Tuberculosis Association*, August, 1938, states that the after care or rehabilitation of the tuberculous patient is an almost untouched field, and cites the fact that less than 1,000 patients are rehabilitated from the 125,000 patients discharged from institutions yearly. It has paid to rehabilitate the deaf and blind, so why not the discharged tuberculous patient?

The weakest link in the anti-tuberculosis campaign is the rehabilitation of the tuberculous patient. On this question, our facilities are shamefully inadequate. The discharged patient does not receive the necessary guidance and support from the social agencies of many communities to safeguard him from a future breakdown. The result is that from 15 to 65 per cent of all patients discharged from all tuberculosis hospitals and institutions have relapses. This certainly is false economy, as it is much cheaper to keep the discharged patient well than it is to pay the cost of re-hospitalization. *A job half done when dealing with public health and human lives, regardless of how good the intentions, can only lead to criticism for its incompleteness.* Anyone who has it within his power to help correct these conditions and fails to do so, commits a serious offense against society. They are every bit as guilty as the patient who refuses hospitalization and continues to be a public health menace, or the doctor who does not make a complete examination and treats an open-active case of tuberculosis as a common cold.

There is too large a gap between what is *known* about tuberculosis and what is *done* about tuberculosis. The closer these two conditions can be brought together, the nearer will be the approach in bringing tuberculosis under control or in eliminating it from our cities, our counties and our states. Failure on the part of the cities, counties or states to accept this responsibility is not fair to neighboring communities that have a better tuberculosis control program, for so often the tuberculous patient migrates there, hoping to get medical attention. On the contrary, these unfortunate individuals meet with bitter disappointment and often become stranded away from home, friends, and relatives.

Many communities know that they have a tuberculosis problem and about once a year do a little talking about it, but I can assure

you that if a careful study of the whole problem is not made so that you have a true picture, little or nothing constructive or permanent will be accomplished in bringing this great public health problem under control.

The Anti-Tuberculosis League might well take the initiative, as they did in Cincinnati, by studying the tuberculosis program, compiling the statistics, and presenting its findings to the public and to the local health authorities, so that a definite plan of attack may be formulated to get the quickest and best results from the money available, and to further stimulate public interest, to see that once the plan is undertaken, it will be carried on to a satisfactory completion.

As I have previously mentioned, the position of tuberculosis coordinator of Cincinnati and Hamilton County was sponsored and supported by the Anti-Tuberculosis League. The coordinator presented information about tuberculosis to a coordinating committee, composed of representatives of every leading organization interested in the control of tuberculosis. As a result, many worthwhile things have been accomplished. For instance:

- 1) Quicker and better relief to tuberculous families by the Welfare Department.

- 2) Better housing to the tuberculous families; reduction of overcrowding among indigent families; and slum clearance through the efforts of the Welfare Department and Better Housing League.

- 3) Better and more effective cooperation and coordination of all social, welfare, and health agencies.

- 4) Additional money every month from Cincinnati's Finance Committee of City Council to help tuberculous families.

- 5) Additional public health nurses in the Boards of Health to do tuberculosis follow-up work, and see that all contacts are examined promptly and regularly.

- 6) By working in close cooperation with the trustees of the Hamilton County Tuberculosis Hospital, a decision was reached whereby the Preventorium was closed, making available additional hospital beds; thus the waiting list of open-active cases for the Tuberculosis Hospital was eliminated. This also relieved the tuberculosis situation at the Cincinnati General Hospital.

- 7) By working with the local Boards of Health and the Ohio State Health Department in getting incorrigible open-active cases of tuberculosis that constituted a public health menace quarantined.

- 8) After demonstrating the value of the tuberculosis coordinator, this position has now been taken over by the Hamilton County Tuberculosis Hospital, and it will be a part of his duties to see that every discharged tuberculous patient returns to his private physician or clinic for check-ups and reexaminations.



With the closing of the Preventorium, the Anti-Tuberculosis League employed a well-trained pediatrician as pediatric coordinator to conduct children's chest clinics and coordinate the work of all children exposed to tuberculosis.

In addition, the Anti-Tuberculosis League conducts eleven Negro and two white Health Clubs with meetings every month, at which time health topics are discussed and movies about tuberculosis are shown.

The League finances two night chest clinics every week at the Health Center. There contacts in the lower economic group who find it impossible to report to the day chest clinics can be examined.

The League conducts two Health Camps every summer for a period of ten weeks, one for white and one for colored children who have been in contact with an open-active case of tuberculosis during the past two years. This is in order to build up their resistance and to try to prevent the development of tuberculosis.

From time to time the Anti-Tuberculosis League conducts tuberculin testing programs in the various school groups, conducts case-finding surveys, and sponsors refresher courses for nurses.

This organization also conducts a well-organized, continuous educational program about tuberculosis through the press, through lectures to Parent-Teacher Associations, through neighborhood meetings, clubs, and churches. Lectures are also given in the various schools, with distribution of suitable literature about tuberculosis. Movies about tuberculosis are also shown whenever possible.

Such a program as outlined was made possible through the sale of Christmas Seals and supplemental assistance from the Community Chest.

After carefully studying the problems of tuberculosis in Cincinnati and Hamilton County, I believe that 85 to 90 per cent of the blame can be placed on the patients for our local situation, while 10 to 15 per cent is due to all other agencies. This probably holds true in any average community. Any indifference on the part of the patients, some physicians, the hospitals and the various organizations, to accept their full responsibility pertaining to tuberculosis determines whether or not a community can have a good tuberculosis control program.

Knowing the problems of tuberculosis in the City of Cincinnati, with its death rate of approximately 77 per 100,000 of population, I can appreciate the magnitude of the tuberculosis problem in the state of Tennessee which has a death rate from tuberculosis of approximately the same figure. I see a shining ray, as reported in the April *Bulletin of the National Tuberculosis Association*, that "The 1941 legislature in Tennessee was extremely health-conscious in appropriating \$100,000 to the state department of health per



annum; \$190,000 per annum to establish and help finance county health department, and \$500,000 for the establishment of a tuberculosis hospital." You should urge the legislature to keep up the good work.

During 1940, the people of the United States spent:

\$ 56,721,746 for chewing gum  
134,525,233 for cigars and cigarettes  
282,002,617 for ice cream

Certainly if the public can afford to spend nearly half a billion dollars on these three items during a year, I feel the public would gladly contribute to the support of a program of tuberculosis prevention and control if and when the public is sufficiently educated to the public health aspects of tuberculosis.

Tuberculosis can be eradicated. However, it calls for a sizeable expenditure and herein lies our greatest handicap. Money spent in the fight against tuberculosis today helps to protect your home against tuberculosis, and will save the taxpayers large sums of money in the future by reducing the incidence of the disease, the number of patients requiring hospitalization, and the number of families on relief as this great public health problem is brought under control.

Dr. Louis I. Dublin very forcibly called this matter to the attention of all those present in his address at the annual meeting of the American Public Health Association in Detroit, Michigan, on October 9, 1940, when he stated: "It is estimated that in the two years, 1937-1939, when the Detroit City Council was backing the Health Department with \$400,000 in the tuberculosis case-finding program, more than \$1,300,000 was saved to the City of Detroit in potential hospital bills by discovering and treating cases in their early stages and through the prevention, by this means, of additional cases."

To be sure, a great deal of progress has been made in tuberculosis control. A few facts to refresh one's memory:

In 1900, there were 202 deaths from tuberculosis in the United States per 100,000 of population.

In 1940, this has dropped to approximately 46 deaths per 100,000 of population.

In 1920, tuberculosis ranked first in the causes of death in the United States.

In 1940, tuberculosis ranked eighth in the causes of death in the United States. However, we should not be lulled into a sense of false security, as one needs only to be reminded of the facts that:

- 1) Tuberculosis still ranks first in the causes of death between the ages of 15 and 45 years of age, and,
- 2) One death in every four in young women between the ages of

20 and 30 years is due to tuberculosis.

*Education with regulation, if necessary, offers our best approach in tuberculosis control*, but the best weapon in the world is ineffective unless it is used. Indifference, not opposition, is the greatest enemy of progress.

We must look to the Federal Government, our state, county, and municipal authorities for correction of our present situation, and improvement will come largely through the influence exerted by public opinion. There is no better way to mold public opinion than through a well-organized and well-directed educational program sponsored by the Tuberculosis and Medical Societies.

A great deal has been said and written about various things and conditions which affect National Defense. There can be no doubt about the role of tuberculosis in this program, as approximately 35,000 young people between the ages of 15 and 45 years die every year from this great scourge. National defense and security depends to a large degree upon national health; therefore, it becomes a patriotic duty as well as a civic and public health duty to lend our efforts toward its control.

It should, without any question, be the duty of everyone in the State of Tennessee to support such a program to bring the great public health menace, tuberculosis, under control, and results will be in direct proportion to your efforts and the amount of money made available to do a real job.

#### SUMMARY

Tuberculosis affects every man, woman and child in the community from a medical, public health, or economic standpoint.

It is very probable that the following conditions exist today in any community where tuberculosis is not definitely under control:

- 1) The problem of tuberculosis is not fully appreciated by either the medical profession or the general public.

- 2) There is a serious lack of effective cooperation and coordination of all agencies dealing with this problem.

- 3) To bring tuberculosis under control, more money must be spent now in order to save money in later years.

According to Dr. H. I. Spector, some of the obstacles in the control of tuberculosis are:

- 1) A shortage of hospital beds.

- 2) Late diagnosis.

- 3) The low financial status of the patient in numberless instances and his unwillingness to stop work.

- 4) The inability on the part of the general practitioner to recognize the disease in its early stage.

- 5) Our failure to rehabilitate the arrested case economically.

The four major activities in any campaign against tuberculosis are: Education, Diagnosis, Treatment and Rehabilitation.

The public must be constantly and increasingly educated as to the dangers and contagiousness of tuberculosis. Physicians and public officials must be educated as to the part they can play in the control of the disease.

We should strive for earlier diagnoses and immediate hospitalization.

Rehabilitation, along with education, has been sadly neglected. On this question, our facilities are shamefully inadequate.

Tuberculosis can be eradicated. However, it calls for a sizeable expenditure and herein lies our greatest handicap.

Education with regulation, if necessary, offers our best approach in tuberculosis control. Indifference, not opposition, is the greatest enemy of progress.

#### RESUMEN

La tuberculosis afecta a cada hombre, mujer y niño en la comunidad desde los puntos de vista médico, sanitario o económico.

Es muy probable que existan hoy las siguientes condiciones en cualquiera comunidad en la que la tuberculosis no esté definitivamente dominada:

- 1) Ni la profesión médica, ni el público en general comprenden del todo el problema de la tuberculosis.

- 2) Existe una seria falta de cooperación y coordinación efectivas entre las diferentes instituciones que tienen que ver con este problema.

- 3) Para dominar la tuberculosis es necesario gastar más dinero ahora a fin de ahorrarlo en los años venideros.

De acuerdo con el Dr. H. I. Spector, algunos de los obstáculos en el control de la tuberculosis son:

- 1) La insuficiencia de camas en los hospitales.

- 2) El diagnóstico tardío.

- 3) La humilde condición económica del paciente en casos innumerables y su poca voluntad para dejar de trabajar.

- 4) La incapacidad de parte del médico general para reconocer la enfermedad en su período incipiente.

- 5) Nuestro fracaso en la rehabilitación económica del caso estacionado.

Las cuatro actividades principales en la lucha anti-tuberculosa son: Educación, Diagnóstico, Tratamiento y Rehabilitación.

Debe educarse al público constantemente y cada vez más acerca de los peligros y la contagiosidad de la tuberculosis. Precisa educar a los médicos y a las autoridades públicas acerca del papel que deben desempeñar en el control de la enfermedad.

Nos debemos esforzar por hacer diagnósticos tempranos y por conseguir la hospitalización inmediata.

La rehabilitación, junto con la educación, ha sido lastimosamente descuidada. Nuestras facilidades para remediar este mal son vergonzosamente inadecuadas.

La tuberculosis puede ser erradicada. Empero, ésto demanda un desembolso bastante grande, y ese es nuestro mayor obstáculo.

La educación, y si es necesaria, la reglamentación, nos ofrece la mejor manera de abordar el problema del control de la tuberculosis. La indiferencia, y no la oposición, es el mayor enemigo del progreso.

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## COLLEGE COMMITTEES\*

### COMMITTEE TO ESTABLISH A BOARD FOR DISEASES OF THE CHEST

J. Winthrop Peabody, M.D., F.C.C.P., <i>Chairman</i>	Washington, D. C.
Charles M. Hendricks, M.D., F.C.C.P.	El Paso, Texas
Chevalier L. Jackson, M.D., F.C.C.P.	Philadelphia, Pa.
Edgar Mayer, M.D., F.C.C.P.	New York, New York
Joseph C. Placak, M.D., F.C.C.P.	Cleveland, Ohio

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### COMMITTEE ON THE MANAGEMENT AND TREATMENT OF DISEASES OF THE CHEST

Edwin R. Levine, M.D., F.C.C.P., <i>Chairman</i>	Chicago, Illinois
Colonel John B. Grow, M.C., F.C.C.P.	Denver, Colorado
Hillis L. Seay, M.D., F.C.C.P.	Huntersville, N. C.

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#### *Sub-Committees*

### COMMITTEE ON SURGICAL TREATMENT OF DISEASES OF THE CHEST

Evarts A. Graham, M.D., F.C.C.P., <i>Chairman</i>	St. Louis, Missouri
Alton Ochsner, M.D., F.C.C.P., <i>Vice-Chairman</i>	New Orleans, Louisiana
Samuel O. Freedlander, M.D., F.C.C.P.	Cleveland, Ohio
Thomas J. Kinsella, M.D., F.C.C.P.	Minneapolis, Minnesota
Richard H. Overholt, M.D., F.C.C.P.	Brookline, Massachusetts

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### COMMITTEE ON NON-SURGICAL COLLAPSE THERAPY

Harold G. Trimble, M.D., F.C.C.P., <i>Chairman</i>	Oakland, California
Giles Wolverton, M.D., F.C.C.P., <i>Vice-Chairman</i>	Dayton, Ohio
Benson Bloom, M.D., F.C.C.P.	Tucson, Arizona
W. LeRoy Dunn, M.D., F.C.C.P.	Washington, D. C.
Foster Murray, M.D., F.C.C.P.	Brooklyn, New York

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### COMMITTEE ON CHEMOTHERAPY AND ALLIED MEASURES

Karl H. Pfuetze, M.D., F.C.C.P., <i>Chairman</i>	Cannon Falls, Minnesota
Raphael A. Bendove, M.D., F.C.C.P., <i>Vice-Chairman</i>	New York, New York
Reuben Hoffman, M.D., F.C.C.P.	Henryton, Maryland
Arthur Rest, M.D., F.C.C.P.	Spivak, Colorado
John V. Thompson, M.D., F.C.C.P.	Indianapolis, Indiana

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### COMMITTEE ON GENERAL MANAGEMENT AND REHABILITATION OF DISEASES OF THE CHEST

Martin M. Collier, M.D., F.C.C.P., <i>Chairman</i>	Grenloch, New Jersey
Otto C. Schlack, M.D., F.C.C.P., <i>Vice-Chairman</i>	Oak Forest, Illinois
Grover C. Bellinger, M.D., F.C.C.P.	Salem, Oregon
George D. Kettelkamp, M.D., F.C.C.P.	Koch, Missouri
Horace LoGrasso, M.D., F.C.C.P.	Perrysburg, New York

\*The names of the members serving on other College councils and committees were published in the September-October, 1944 issue, *Diseases of the Chest*.

## COLLEGE NEWS

### SEMI-ANNUAL MEETING, BOARD OF REGENTS

The semi-annual meeting of the Board of Regents of the College was held in connection with the annual meeting of the Southern Chapter of the College at the DeSoto Hotel, St. Louis, Missouri, November 13, 1944, while this issue of the journal was on the press.

A number of College councils and committees made plans to meet at St. Louis, and the reports of these councils and committees will be published in an early issue of the journal.

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### COLLEGE CHAPTER NEWS

#### *Southern Chapter*

The annual meeting of the Southern Chapter of the College was held at St. Louis, November 13 and 14. A copy of the program was published in the last issue of the journal, and a complete report of the meeting will be published in the next issue of *Diseases of the Chest*.

Dr. Paul H. Ringer, F.C.C.P., Asheville, North Carolina, is the retiring president of the Southern Chapter of the College. The scientific program was prepared under the chairmanship of Dr. Paul A. Turner, F.C.C.P., Louisville, Kentucky. Dr. H. I. Spector, F.C.C.P., St. Louis, Missouri, was chairman of the Local Arrangements Committee.

Benjamin L. Brock, M.D., F.C.C.P.  
Secretary-Treasurer,  
Southern Chapter.

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#### *Rocky Mountain Chapter Organized*

The Rocky Mountain Chapter of the American College of Chest Physicians was organized at a meeting held at the Cosmopolitan Hotel, Denver, Colorado, September 27, 1944, and the following officers were elected:

President, Colonel John B. Grow, F.C.C.P., Denver, Colorado.

First Vice-President, Carl H. Gellenthien, M.D., F.C.C.P., Valmora, New Mexico.

Second Vice-President, William C. Walker, M.D., F.C.C.P., Salt Lake City, Utah.

Secretary-Treasurer, W. Bernard Yegge, M.D., F.C.C.P., Denver, Colo.

Dr. Arnold Minnig, F.C.C.P., Denver, Colorado, Governor of the College for the State of Colorado, presided at the organization meeting, and Dr. G. Burton Gilbert, F.C.C.P., Colorado Springs, Colorado, Regent of the College for the district, was chairman of the Nominating Committee. Colonel H. P. Marvin, F.C.C.P., Denver, Colorado, and Dr. J. E. Harris, F.C.C.P., Albuquerque, New Mexico, were the other two members of the Nominating Committee.

Following the organization of the chapter, the meeting was addressed by Dr. Louis Mark, F.C.C.P., Columbus, Ohio, who spoke on "The Role of the Chest Specialist in the Control of Tuberculosis."

Colonel John B. Grow, F.C.C.P., was chairman of the Scientific Program Committee, and Dr. W. Bernard Yegge, F.C.C.P., was chairman of the Reception and Entertainment Committee. An excellent scientific program was presented, and 130 physicians registered for the meeting.

W. Bernard Yegge, M.D., F.C.C.P.  
Secretary-Treasurer,  
Rocky Mountain Chapter.

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#### *Wisconsin Chapter Organized*

The Wisconsin Chapter of the College was organized at a meeting held in conjunction with the annual meeting of the Wisconsin State Medical Society, at the Schroeder Hotel, Milwaukee, September 17. The following officers were elected:

President, Alfred A. Busse, M.D., F.C.C.P., Jefferson.  
Vice-President, Herbert H. Christensen, M.D., F.C.C.P., Wausau.  
Secretary-Treasurer, Leon H. Hirsh, M.D., West Allis.

These names were presented by the Nominating Committee, comprised of Dr. Andrew L. Banyai, F.C.C.P., Wauwatosa, Chairman, Leonard W. Moody, M.D., F.C.C.P., Bayfield, and Bert L. Jones, M.D., F.C.C.P., Wood, and the candidates were unanimously elected to hold office for the ensuing year.

Dr. Carl O. Schaefer, F.C.C.P., Racine, presided at the meeting, and following the organization of the chapter, he introduced Dr. Jay Arthur Myers, F.C.C.P., Minneapolis, Minnesota, President of the College, who spoke on "The Medical Profession in the Control of Tuberculosis."

A large delegation of officials and other physicians from the Illinois Chapter attended the meeting and participated in the scientific program.

Leon H. Hirsh, M.D.  
Secretary-Treasurer,  
Wisconsin Chapter.

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#### *Pennsylvania Chapter*

The annual meeting of the Pennsylvania Chapter of the College was held at Pittsburgh, September 19, 1944. The following officers were elected:

President, Ross K. Childerhose, M.D., F.C.C.P., Harrisburg.  
Vice-President, Chevalier L. Jackson, M.D., F.C.C.P., Philadelphia.  
\*Secretary-Treasurer, Edward Lebovitz, M.D., F.C.C.P., Pittsburgh.

Dr. J. C. Placak, F.C.C.P., Cleveland, Ohio, Chairman of the Board of Regents of the College, was the guest of honor and addressed the annual dinner meeting of the chapter. This was followed by an x-ray conference.

Edward Lebovitz, M.D., F.C.C.P.  
Secretary-Treasurer,  
Pennsylvania Chapter.

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\*Re-elected.

*Michigan Chapter*

The Michigan Chapter of the College met in conjunction with the annual meeting of the Michigan State Medical Society, at the Pantlind Hotel, Grand Rapids, Michigan, September 28. The meeting was addressed by Dr. Jay Arthur Myers, F.C.C.P., Minneapolis, Minnesota, President of the College.

A Symposium on Atypical Pneumonia (Diagnosis and Treatment) was presented by Dr. Norman Clarke, F.C.C.P., Detroit, and Dr. Oliver Marcotte, F.C.C.P., Detroit. These papers were concerned with a resumé of the status of the so-called virus pneumonia and its peculiarities as compared with the more commonly accepted type.

Dr. Herman E. Hilleboe, F.C.C.P., Washington, D. C., spoke before the general assembly of the state medical society.

William P. Chester, M.D., F.C.C.P.  
Secretary-Treasurer,  
Michigan Chapter.

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*Indiana Chapter*

The Indiana Chapter of the American College of Chest Physicians held a luncheon meeting in conjunction with the Anti-Tuberculosis Committee of the Indiana State Medical Association at Indianapolis, Indiana, on October 3, 1944.

An interesting discussion of bronchial tumors, illustrated with bronchoscopic motion pictures showing bronchial tumors, was presented by Dr. Paul H. Holinger, F.C.C.P., Chicago, Illinois. This was followed by an x-ray conference.

At the business meeting a constitution was adopted and the following officers were elected for the ensuing year:

President, Philip H. Becker, M.D., F.C.C.P., Crown Point.  
Vice-President, Edward W. Custer, M.D., F.C.C.P., South Bend.  
\*Secretary-Treasurer, Hubert B. Pirkle, M.D., F.C.C.P., Rockville.  
About sixty members and guests attended the meeting.

Hubert B. Pirkle, M.D., F.C.C.P.  
Secretary-Treasurer,  
Indiana Chapter.

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\*Re-elected.

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*Mexican Chapter*

The First National Tuberculosis Congress of Mexico was assembled at Mexico City during the last week of July, under the auspices of the Ministry of Public Health and Welfare. Dr. Baz, Secretary of the Ministry, presided at the opening session of the Congress in behalf of the President of the Republic of Mexico.

A majority of the members of the Mexican Chapter of the College presented scientific papers at the Congress. Members of the College from the United States of America who participated in the Congress were Dr. George G. Ornstein, F.C.C.P., New York, N. Y., who read a paper on "Pathogenesis of Tuberculosis," and Dr. Leo Eloesser, F.C.C.P.,



San Francisco, California, who presided at several of the sessions and also made a number of speeches in Spanish.

A group of Cuban specialists, most of them members of the Cuban Chapter of the College, who attended the Congress, included:

Dr. Francisco J. Menendez, F.C.C.P.  
Dr. Juan J. Castillo, F.C.C.P.  
Dr. Modesto Arturo Manas.  
Dr. Luis de la Cruz Munoz.  
Dr. Hector Madariaga.  
Dr. Pedro Domingo.

Dr. Aresky Amorim, F.C.C.P., Rio de Janeiro, Brazil, a member of the Brazilian Chapter of the College, attended the Congress, and he participated in the presentation of a medal and diploma from the Brazilian College of Surgeons to Dr. Donato G. Alarcon, F.C.C.P., Regent of the American College of Chest Physicians in Mexico.

Drs. Alarcon, Cosio Villegas, and Jiminez, officials of the College, received the Gold Medal from the Cuban Tuberculosis Council for outstanding work against tuberculosis.

This Congress which was sponsored by the Mexican Association for the Study of Tuberculosis, was attended by 400 physicians, of which nearly 100 were chest specialists. More than 100 papers on various phases of chest diseases were read at the Congress, and the society is to be congratulated upon the brilliant success of this meeting.

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#### *Peru Chapter Organized*

The members of the American College of Chest Physicians in Peru met at the Peruvian Medical Association Headquarters at Lima on August 13, 1944, and founded the Peruvian Chapter of the American College of Chest Physicians. The following officers were elected:

President, Dr. Ovidio Garcia Rosell, F.C.C.P.  
Vice-President, Dr. Juan Escudero Villar, F.C.C.P.  
Secretary-Treasurer, Dr. Max Espinosa Galarza, F.C.C.P.  
Treasurer, Dr. Luis G. Hubner, F.C.C.P.  
Bibliothecary, Dr. Mario Pastor B., F.C.C.P.

In addition to the officers, the charter members of this chapter are:

Dr. Dagoberto E. Gonzalez, F.C.C.P.  
Dr. Juan Macchiavello, F.C.C.P.  
Dr. Leopoldo Molinari Balbuena, F.C.C.P.  
Dr. Victor M. Tejada, F.C.C.P.  
Dr. Ramon Vargas Machuca, F.C.C.P.  
Dr. Juan A. Werner, F.C.C.P.  
Dr. Horacio Cachay Diaz.  
Dr. Roman del Castillo.  
Dr. Flavio Guadalupe Guija  
Dr. Angel Luis Morales.  
Dr. Victor Narvaez Obezo  
Dr. Humberto Valderrama Delgado.  
Dr. Pedro Zevallos Alegre.

### *Cuban Chapter*

The Cuban Chapter of the College announces that the Sixth Pan American Congress of Tuberculosis (ULAST) will meet at Havana, Cuba, January 15-21, 1945, under the presidency of Dr. Juan J. Castillo, F.C.C.P. This Congress is being sponsored by the Cuban Government and outstanding chest specialists from all of the Latin American countries have been invited to participate in this important conference.

The Fifth Pan American Congress was held at Buenos Aires, Argentina in 1940, and it was one of the most important events in the fight against tuberculosis held in this hemisphere. It is expected that a large delegation of members of the American College of Chest Physicians from many countries will meet at Havana in January, 1945. Dr. Jay Arthur Myers, F.C.C.P., President of the College, has received a special invitation to attend this Congress.

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### *New Jersey Chapter*

The New Jersey Chapter of the American College of Chest Physicians will meet at the Valley View Sanatorium, Paterson, New Jersey on Tuesday, November 21, 1944.

Dr. Edgar Mayer, F.C.C.P., New York City, will be the guest speaker. He will present a paper on "Pulmonary Emphysema."

The members of the Passaic County Medical Society will be guests of the Chapter.

Harold S. Hatch, M.D., F.C.C.P.  
Secretary-Treasurer,  
New Jersey Chapter.

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### *New York State Chapter*

The New York State Chapter of the College will hold its annual meeting at the Hotel Biltmore, New York City, on Thursday, February 1, 1945. The program for the meeting will appear in a later issue of the journal.

Dr. James H. Donnelly, F.C.C.P., Buffalo, President of the New York State Chapter, has appointed the following committees:

*Nominating Committee:*

George G. Wagner, M.D., F.C.C.P., Perrysburg, *Chairman*.

Major Swen L. Larson, F.C.C.P., New Rochelle.

George A. Lassman, M.D., F.C.C.P., New York City.

*Membership Committee:*

George F. Herben, M.D., F.C.C.P., Yonkers, *Chairman*.

Helen G. Walker, M.D., F.C.C.P., Buffalo.

*Public Relations Committee:*

Nelson W. Strohm, M.D., F.C.C.P., Buffalo, *Chairman*.

Harry Golembe, M.D., F.C.C.P., Liberty.

Edgar Mayer, M.D., F.C.C.P., New York City.

*Program Committee:*

Arthur Q. Penta, M.D., F.C.C.P., Schenectady, *Chairman*.

Donald R. McKay, M.D., F.C.C.P., Buffalo

George G. Ornstein, M.D., F.C.C.P., New York City.

Arthur Q. Penta, M.D., F.C.C.P.  
Secretary-Treasurer,  
New York State Chapter.

## COLLEGE NEWS NOTES

*College Fellows Participate in Meeting at J. C. R. S.*

On September 25, 1944, a number of Fellows of the College who were in Denver, in connection with the meeting of the Rocky Mountain Chapter of the College participated in a scientific program held at the Jewish Consumptive Relief Society, Spivak, Colorado. Dr. Arthur Rest, F.C.C.P., Medical Director of the sanatorium read a paper on "The Role of the Roentgenogram in Tuberculosis Case Finding." This paper was discussed by Captain William Roper, M.C., Fitzsimons General Hospital, Denver; Dr. Richard Davison, F.C.C.P., Chicago, Illinois; Dr. Louis Mark, F.C.C.P., Columbus, Ohio; Dr. Karl Pfuetze, F.C.C.P., Cannon Falls, Minnesota; and Dr. Casper F. Hegner, Denver. The paper was demonstrated with x-ray films.

Dr. Louis Mark, F.C.C.P., Columbus, Ohio, the guest speaker of the evening, spoke on "Fads and Fancies in the Treatment of Tuberculosis."

Refreshments were served following the meeting.

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Dr. Louis Mark, F.C.C.P., Columbus, Ohio, Regent of the College, read a paper before the meeting of the Mahoning County Medical Society, Canton, Ohio, on October 25. Dr. Mark spoke on "The Management of Pulmonary Disease."

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*Croix de Guerre to Lt. Col. Chester J. Mellies*

Lt. Col. Chester J. Mellies, a Fellow of the American College of Chest Physicians, formerly of Mt. Vernon, Missouri, was recently decorated with the French Croix de Guerre and the Bronze Star for exceptional services rendered in collaboration with the French troops in Italy. Colonel Mellies who has been overseas for more than two years and has participated in the North African and Sicilian campaigns, served on the staff of the Missouri Tuberculosis Sanatorium in Mount Vernon, before entering the armed services.

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